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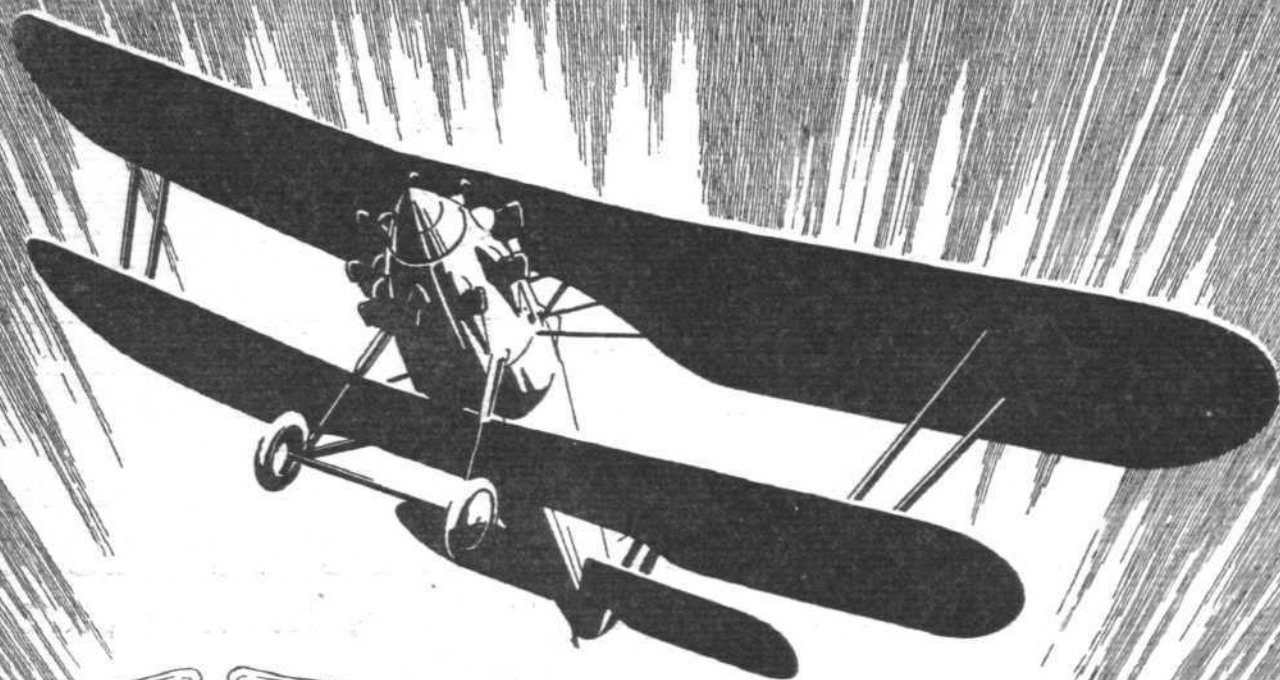
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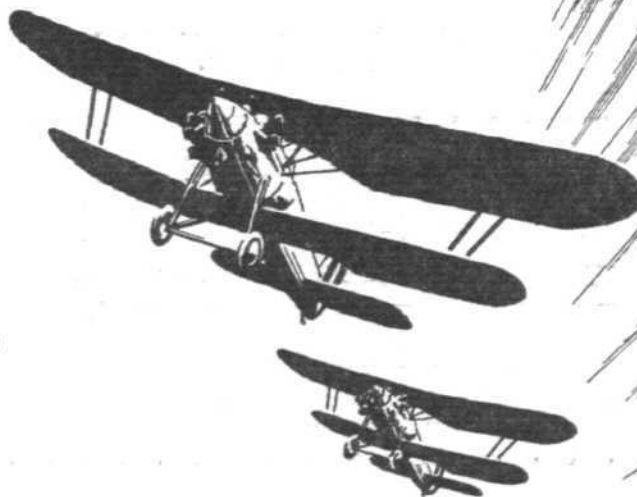
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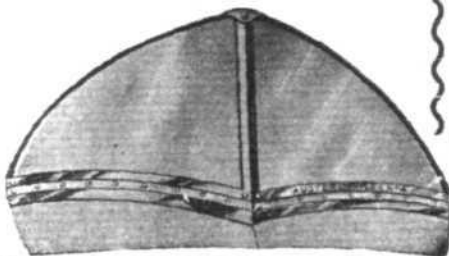
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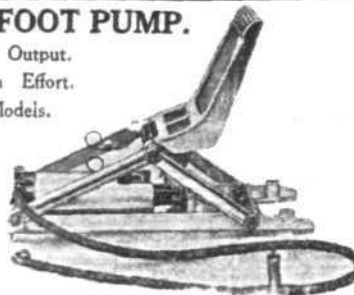
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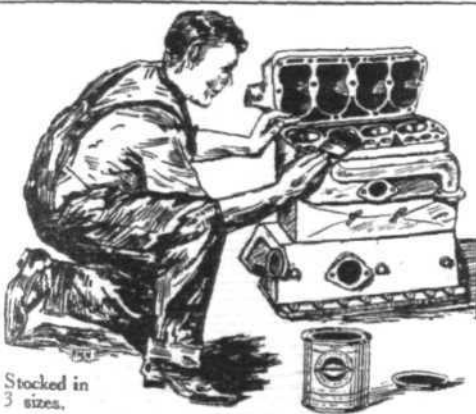
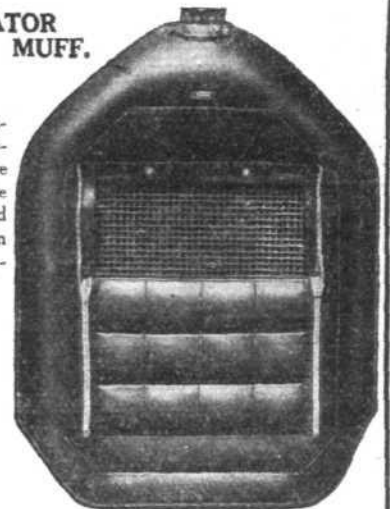


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Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM

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DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list—

1929.	
Mar. 14	Lecture, "Engine Performance Tests," by Wing-Commr. C. B. Hynes, before R.Ae.S. and Inst.Ae.E.
Mar. 18	Lecture, "The Helicogyre," by V. Isacco, before R.Ae.S. and Inst.Ae.E.
Mar. 27	Royal Aero Club Annual General Meeting.
Mar. 29-30	Cinque Ports Flying Club Easter Meeting, Lympne.
April 11	Lecture, "Wind Tunnel Methods of the Eiffel Laboratory," by M. Lapresle, before R.Ae.S. and Inst.Ae.E.
April 18	Lecture, "R.101," by Col. V. C. Richmond, before R.Ae.S. and Inst.Ae.E.
April	Exhibition of Sporting and Touring Aircraft, Switzerland.
May 21	Northampton Air Pageant.
June 19-22	F.I.A. Conference, Copenhagen.
June 27-30	Rotterdam International Air Meeting.
July 5-6	King's Cup Race.
July 13	R.A.F. Display at Hendon.
July 16-27	7th International Aero Exhibition, Olympia.
July 28	International Flying Meeting, Sweden.
Aug. 1-14	French Light Plane Meeting, Oly.
Aug. 15	International Balloon Race, Poland.
Sept. 6-7	Schneider Trophy Race, Solent.

EDITORIAL COMMENT



ALTHOUGH somewhat long, the speech made in the House of Commons by the Secretary of State for Air, Sir Samuel Hoare, in introducing the Air Estimates for 1929, was extraordinarily interesting, and summed up very fairly the present position of British aviation. With the greater portion of the speech there is little need for us to deal here, but one or two points appear to deserve to be specially noted. We commented last week on the fact that the number of squadrons which it is proposed to add during the present year is somewhat illusory insofar as Home Defence is concerned, and there is thus no necessity for returning to the subject this week.

In dealing with civil aviation, Sir Samuel Hoare made some very interesting statements which may come as a surprise to many of our readers. "Upon the civil side," he said, "we are concentrating on the development of new and up-to-date types of machine for civil transport. Among the first items in our programme are a boat of new type with twin floats, a larger flying-boat than we have yet constructed, and two aircraft which we hope will enable us to test the rival claims of monoplanes and biplanes for civil purposes."

The statement is just a little ambiguous in that it is not entirely clear whether it is intended to build a twin-hull flying-boat as well as a flying-boat larger than any hitherto tackled, or whether the twin-hull boat is the largest we have built so far. Either way it is interesting and gratifying to learn that we are to make experiments with large seagoing aircraft. The twin-hull arrangement of a boat has, as far as we know only been successfully tried on the Savoia in which Pinedo made some of his famous flights. It is frequently advanced as a criticism against the type, and it is a criticism which we ourselves have made, that when running on the sea diagonally to the waves, the working of the two hulls must set up considerable stresses in the wing structure. This is probably not denied, but against it may be argued that the same applies to a twin-float seaplane, where the "wracking" stresses are transmitted to the fuselage

structure. Also Pinedo provided proof of the strength of the Savoia by travelling several hundred miles on the sea during his return flight from America. Presumably, therefore, the twin-hull arrangement can be made of satisfactory strength.

There is little doubt that, generally speaking, Great Britain holds the lead in flying-boat design, but hitherto we have not attempted to produce flying-boats of a size comparable with some that have been built or are being built in Germany, for instance. Whether there is any real advantage in building very large flying-boats is, perhaps, still open to discussion. Structure percentage weight has a habit of going up with size, and but for the fact that seaworthiness is to a large extent a relative expression, and as thus dependent upon size, there would not seem to be any particular reason for producing very large machines. In Germany, however, designers have done a considerable amount of work on large flying boats, and have managed to "cheat" to some extent the natural law of structure increase with size by ingenious design and by increased wing loading, especially the latter. It is just as well for this country to obtain some experience, since there is no doubt that if the large machine is useful and is required, our designers can produce it at least as well as any foreign designers.

The old controversy "Monoplane or Biplane?" has existed ever since man began to fly, and is still not settled. Indeed we doubt if it ever will be settled. Mr. Farren recently looked into the subject very thoroughly in a paper read before the Royal Aeronautical Society, and he arrived at the conclusion that on the whole the biplane is preferable. There are, however, designers who disagree with Mr. Farren, and it is good news to learn from Sir Samuel Hoare that machines are to be ordered which should throw light on the subject.

❖ ❖ ❖

It was inevitable that a certain amount of controversy should arise around the relations of the proposed subsidy to the new company National Flying Services and the existing Light Plane Clubs. The latter have done all the spade work hitherto, and have done it right well. In all fairness, therefore, their past services to the nation should be taken into account. If the organisers of the "Guest Scheme," as it has come to be called, although it would probably be at least as correct to refer to it as the "Edwards Scheme," are able to carry out their project of establishing a large number of aerodromes and landing grounds throughout the country they are entitled to support, for nothing could be more calculated to encourage flying than the existence of plenty of aerodromes. On the other hand, the existing clubs have most certainly earned the support given them in the past, and practically to disregard them in planning for the future does not

The "Guest Scheme" and the Clubs

"C. P.", M.B.E.

CONGRATULATION to Mr. C. P. Robertson, head of the Press Section of the Air Ministry, on his appointment to be a Member of the Order of the British Empire. In his official capacity "C. P." as he is called by all his friends (and they are many), can always be relied upon to provide correct and up-to-date information upon any air subject about which the Press is at liberty to write. That the Press sometimes misinterprets his facts cannot be laid at "C. P.'s" door.

One may imagine that the number of enquiries which daily reach "C. P." is very great. Yet so thoroughly has he

seem quite to be cricket. "Payment by results" is the basis upon which it is intended to work with National Flying Services, this to take the form of a capitation grant for each pilot turned out. To us it seems that the least that should be expected is that the same grant should be made to such clubs as decide to carry on after the expiration of present subsidy arrangements. That would place the clubs on the same footing as the new company as regards "payment by results." Surely there is room for a compromise in this direction.

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On Monday next Mr. V. Isacco will read before the Royal Aeronautical Society a paper dealing with his invention the "Helicogyre," which, briefly explained, is a machine of the Cierva "Autogyro" type, but having its wings rotated by engines placed on the main wing tips and driving small tractor airscrews.

The paper does not give in any great detail the theory of "helicogyre flight," but the author refers to a detailed analysis which he has made, and which he contends promises good results. It appears highly probable that he is quite correct in his calculations. The Air Ministry experts must be assumed to have satisfied themselves that the theory is sound before undertaking to support, financially and otherwise, the building of an experimental machine. But to us it seems that practical considerations may easily outweigh theoretical calculations.

To begin with, the unfortunate pilot who has five engines to look after is hardly to be envied. Presumably each of the four Bristol "Cherubs" mounted on the wing tips will have its own revolutions indicator; otherwise how is the pilot to know whether each engine is doing its share of the work? He will certainly have a revolutions indicator for the fuselage engine. Secondly, he will, presumably, have five carburettor controls to look after. Then there are the aircraft controls. It appears that lift from the windmill can be obtained in two ways in the same machine: either by speeding up the windmill, with the vanes at small camber and incidence (for the ailerons on the vanes will, of course, alter camber as well as incidence), or by allowing them to run slower, but at a greater camber. Then the pilot has the "normal" aircraft controls, elevator and rudder. If his translational speed is sufficient, these controls will be operative. If not, then no amount of hand and foot work on the part of the pilot will make any difference to the machine.

Assuming that the principle of the machine is sound, and that all these difficulties can be overcome, a fairly large five-engined "Helicogyre" is likely to be a noisy "bird," and the unfortunate passengers will literally have "engines in front of them, engines behind them, engines to the right of them, engines to the left of them." It should be interesting to follow the discussion on Monday next.

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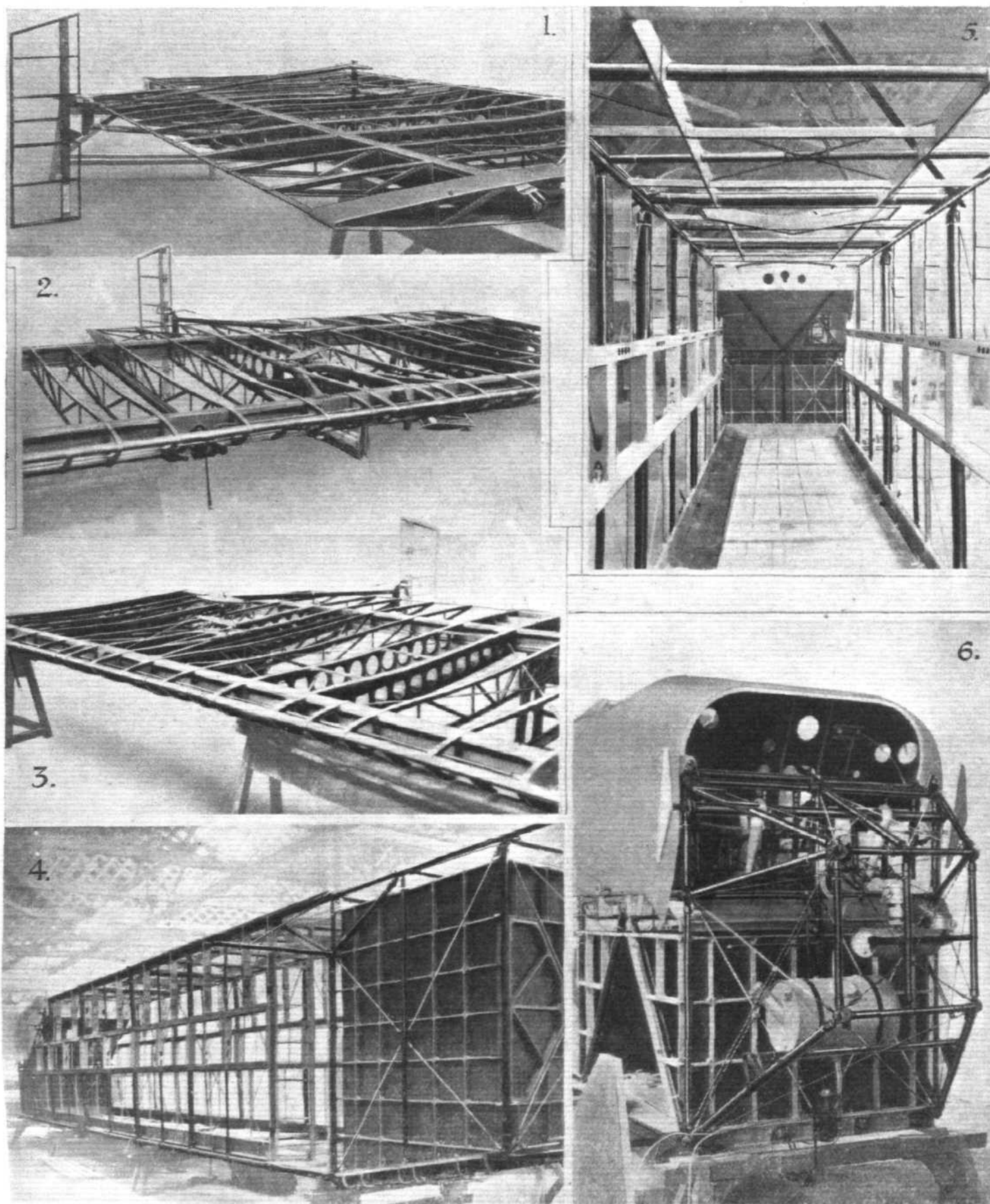
mastered the intricacies of his position that there are very few queries which he cannot answer off-hand without reference. His knowledge ranges from service questions to technical problems, and in the latter his practical experience of flying is invaluable to him. It is a fact, although not apparently well known, that "C. P." served as a pilot during the war, and this may explain his ability to settle many a question relating to practical flying. We, of the Press, have much to thank "C. P." for, and the honour shown to him by the award of the M.B.E. will be regarded by all who have ever had any dealing with him as thoroughly well deserved.

MORE THAN APPEARS ON THE SURFACE



LITTLE BUT GOOD : This is not a new light 'plane but the Parnall "Peto", with Bristol "Lucifer" engine. Alternatively, an Armstrong-Siddeley "Mongoose" may be fitted. Officially described as a float-type reconnaissance machine, the "Peto" is intended to operate from a somewhat unusual "base." Note the strut-bracing of the folding wings, and the "tunnel cowling" of the "Lucifer" cylinders.

NEW PASSENGER CARRIERS FOR 1929

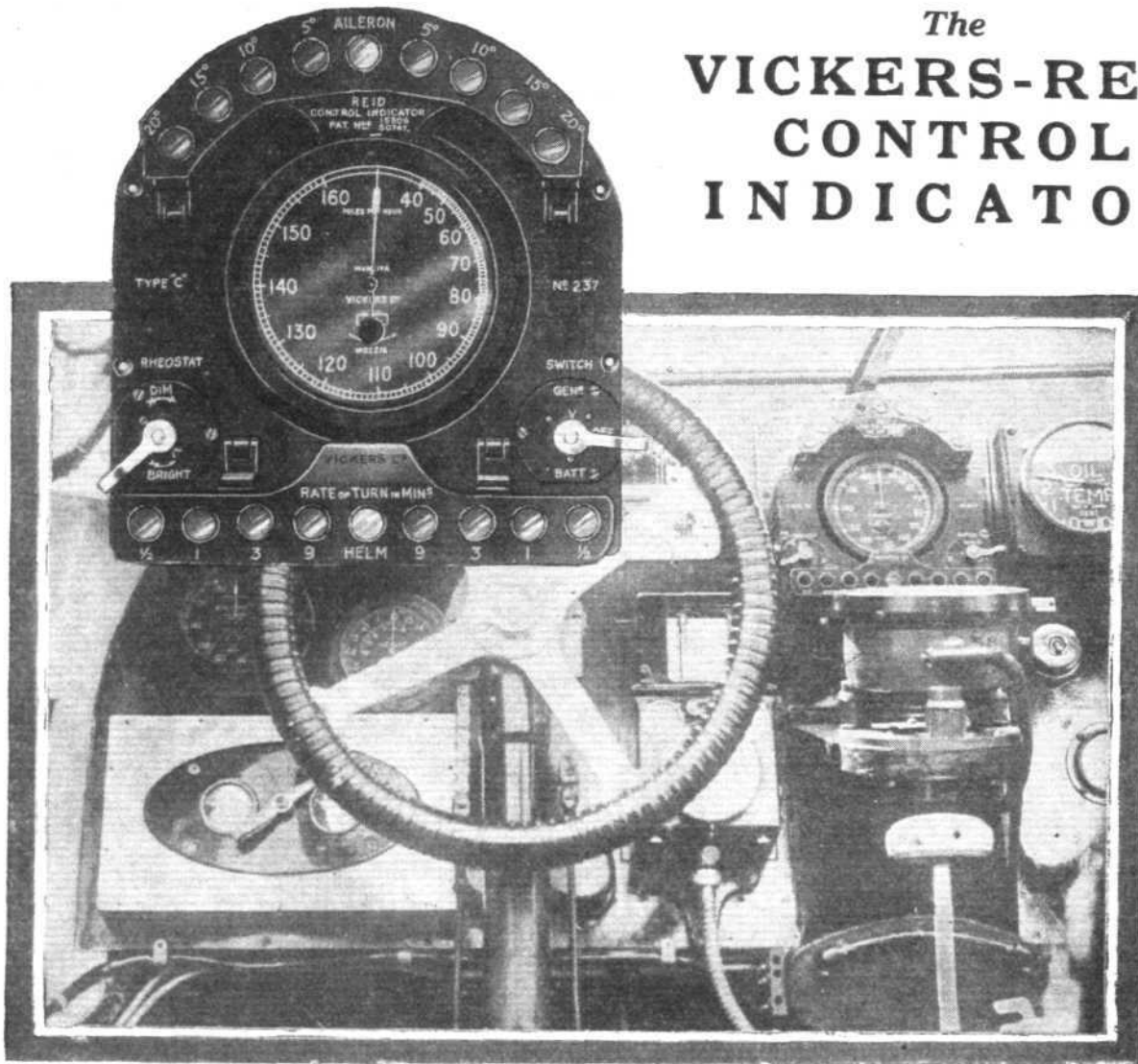


NEW ARMSTRONG-WHITWORTH " ARGOSIES " FOR IMPERIAL AIRWAYS : An improved type of this well-known machine is to be put on the British air routes during the coming season. Among the improvements is the substitution of geared " Jaguar " engines. Of the above photographs, 1, 2 and 3 show a lower wing, to which is attached the servo control for the ailerons. This consists of a small rudder, the angle of which can be varied by the pilot. 4 is a view of the cabin in course of construction while 5 is an internal view, looking forward. The " nose " of the fuselage is shown in 6. The tubular framework will support a quickly detachable engine mounting, fireproof bulkhead, etc. (See also page 205.)

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The Residency,
Kumasi, Ashanti,
GOLD COAST,
Feb. 6th, 1929.

Sirs, I expect you would like to hear something about your engine. Really I can add little or nothing to what I cabled. It is "perfection." I never saw such a cool engine; a minute or two after landing, after say 6 hours continuous flying, it was cold and one could cover up.

The last hops out here were the worst of all by far. 500 miles of nothing but dense forest, with not a hope if a forced landing and I never really worried at any time, she was running so perfectly.

She is revving up still on the ground at 1,850, as when I left Croydon.

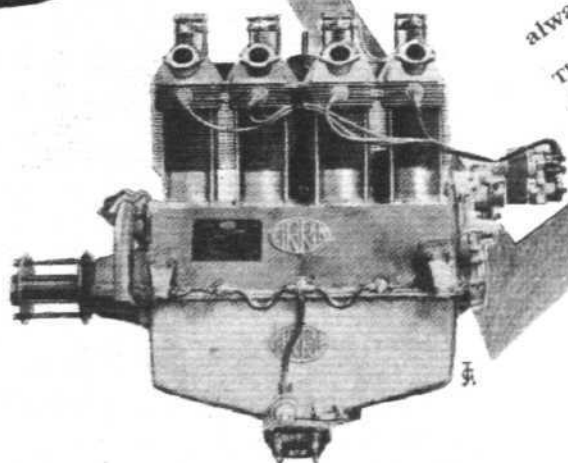
Needless to say I never used a spare, except plugs, which I changed about.

The French and Spanish officials en route always expressed admiration of my Cirrus.

Yours faithfully,
(Signed)

R. S. RATTRAY.

One of the most recent CIRRUS successes was the pioneer flight of Captain R. S. Rattray from ENGLAND to the GOLD COAST 5,000 miles.



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NEW ARMSTRONG-WHITWORTH "ARGOSIES"

Many Improvements in 1929 Types

FOR use on the first stage of the new England-India air route which is to come into operation this spring, Armstrong-Whitworth "Argosies" of improved design are being produced, and are now nearing completion at the Whitley works. We are able to give this week photographs of some of the new features of these machines.

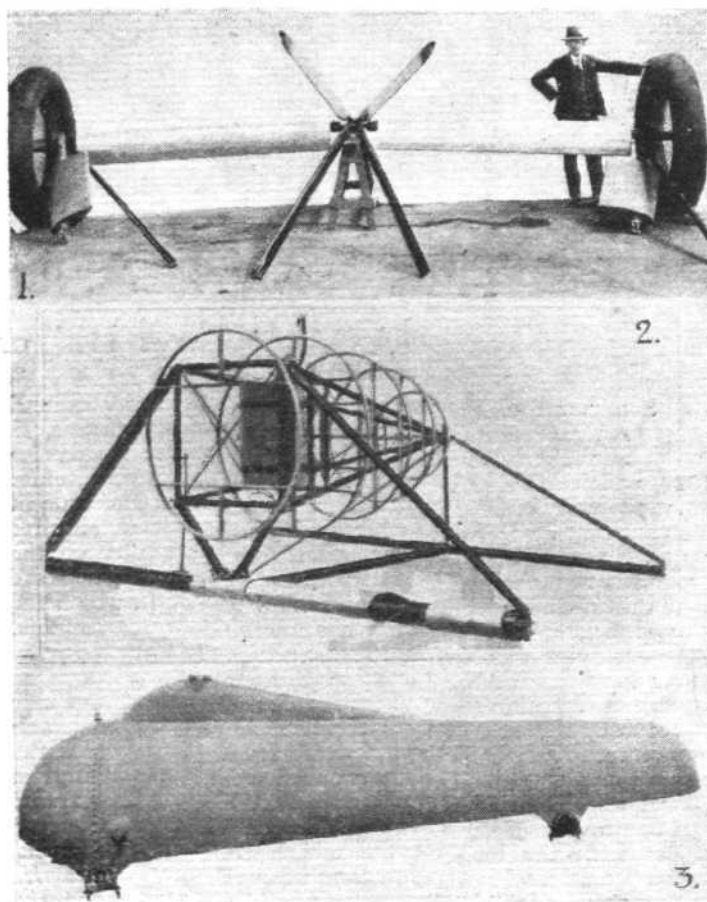
A very interesting innovation is the use of servo-rudders for the lateral controls. The angle of the servo-rudder can be varied by the pilot, and in spite of small forces on the control stick considerable forces may be exerted on the ailerons. Hitherto servo-rudders have been used mainly in connection with the main rudders of an aircraft, and the application of this principle to ailerons is distinctly interesting.

The use of geared "Jaguar" engines on the new "Argosies" should result in a considerable improvement. This will be particularly noticeable in the case of the take-off, where the extra propeller efficiency of the slower-running airscrews should shorten the run to take off considerably, or alternatively enable the machine to take off with a greater load. The economy at cruising speed will probably also be better, and as it seems likely that the new cowling, with which experiments have been carried out with considerable success, will be fitted on the "Argosies," the overall efficiency of the machine should improve to an extent which appeared outside the sphere of practical realisation but a few years ago. In fact, it is to be expected that the new "Argosies" will come much nearer to "paying their way" than has any three-engined machine of the same power. As the "Jaguar" is reliable in service, the new machines should combine in a remarkable degree the freedom from forced landings, coupled with good operational economy.

The mounting of the outboard "Jaguar" in the new machines will differ from that previously used, and one of the photographs shows the framework of the mounting. The skeleton of the former indicates that the cowling behind the engine is to be very complete, and used in conjunction with the "ring" should reduce the drag of the outboard engines a great deal. The mounting of the fuselage engine is shown in another photograph. The tubular framework will carry a fireproof bulkhead and a quickly-detachable engine mounting.

The petrol capacity of the new "Argosies" will be increased to 360 gallons, the fuel being carried in two tanks (one of which is shown in a photograph) of 180 gallons capacity each, slung under the top plane. A petrol gauge will be fitted in the front of each tank so that the pilot can see at any time how much petrol is left. The capacity is estimated to be sufficient for a range of 500 miles.

The wide-track undercarriage unit is also shown in a photograph. The wheels and tyres are made by the Dunlop Company, and springing is by oil-damped buffers.



DETAILS OF THE NEW "ARGOSIES": The landing gear unit is shown in 1, and the mounting for one of the wing engines in 2. One of the large petrol tanks is shown in 3 (inverted). The capacity is 180 gallons.

THE COACH MAKERS AND COACH HARNESS MAKERS DINE

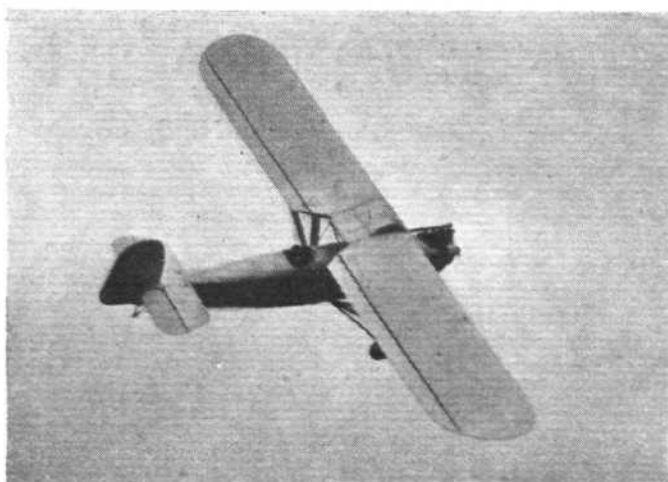
THE Livery Dinner of the Worshipful Company of Coach Makers and Coach Harness Makers took place on March 6. Mr. W. J. McCormack, the Master, presided. Now that this Company has extended its ancient rights and privileges to those who may be entitled to them, connected with the motor and aeronautical industries, its doings are becoming of great importance and interest to these two great arts. The guests numbered many representatives of both, and the Lord Mayor of London (Sir J. E. Kynaston Studd) responding to the civic toast given by Sir Edward Manville, the Upper Warden, said, in the course of an interesting and witty speech, that to dine with the Company of Coach and Coach Harness Makers' was ever pleasurable. The Guild was of ancient origin and its trade still existed in spite of the drastic changes in locomotion. State coaches were, however, not used as of yore. The King and Queen still went in a State coach for the opening of Parliament, and the Lord Mayor occupied that capacious vehicle irreverently called "The Gingerbread Coach" on November 9, when he drove to the Guildhall to be sworn in. Speaking of the history of that coach, the Lord Mayor said that he was told by his coachman that it was built in 1757, and weighed 3 tons 17 cwt. It was so beautifully proportioned that a man 6 ft. high, wearing a bowler hat, could stand inside without touching the top. No lady had ever travelled in it. The panels, which were of great beauty, were painted by Cypriani, and were detachable and (although his great secretary, Sir William Soulsby, would not have it so) they were insured for £16,000.

Lord Colwyn submitted the toast of "The Company," with a speech marked by very humorous stories, and the Master, in responding, said that during its many centuries of history, the Company had justified its existence in a most important and interesting way; but that day it was serving a more useful purpose than ever before by placing itself at the service of youthful kindred associations controlling both land and air transport.

Mr. W. Lawton-Goodman, the Renter Warden, proposed "The Guests," and remarked that the Coachmakers had kept pace with the wheels of progress and followed the evolution of locomotion and transport. He believed that in the next generation the motor car manufacturers would give place to aircraft builders. Indeed, they welcomed that evening among their guests several constructors of aircraft.

Other speakers were Mr. Sydney Guy, Vice-President of the Society of Motor Manufacturers and Traders and Mr. E. C. Gordon England, President of the Motor Agents' Association.

Among those present were:—The Marquis of Cambridge, Sir George Beharrell, Maj.-Gen. Adrian Carton de Wiart, Sir Charles Nicholson, Sir Herbert Austin, Mr. C. A. Mercer, Mr. F. Handley-Page, Mr. E. H. Siddeley, Col. Mervyn O'Gorman, Sir William Letts, Mr. Henry Smith, Sir Charles Morton, Wing-Comdr. F. C. V. Laws, Sir Walter Schroder, Sir Alexander Houston, Mr. Stanley Spooner, Lieut.-Col. A. F. Mulliner, Maj. W. P. Wilton, Mr. Percy Preston, Mr. E. C. M. Barrell, Mr. Ernest Peachell, Mr. D. H. Boggis-Rolfe and Commander H. Perrin.



THE WESTLAND "WIDGEON IIIA"

A.D.C. "Cirrus III" or D.H. "Gipsy" Engines

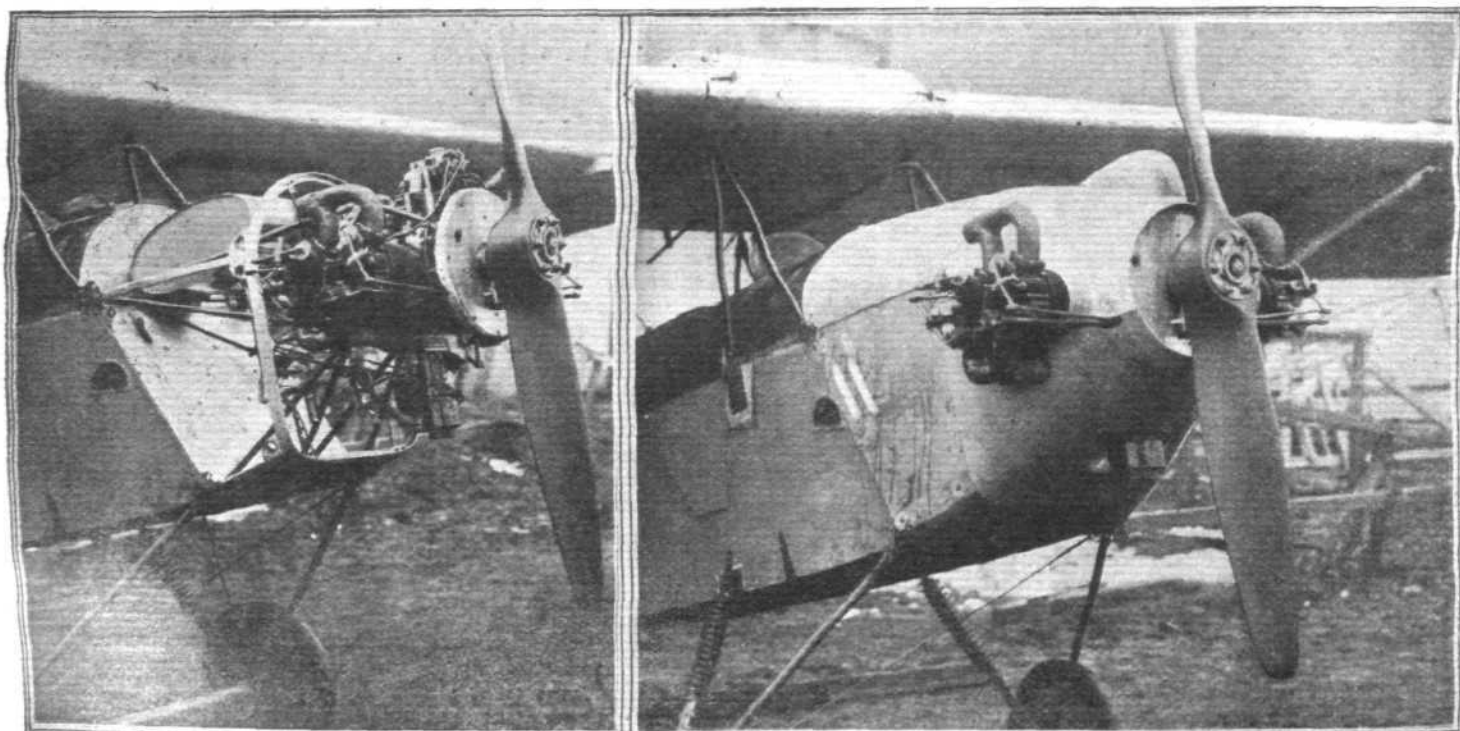
AS a result of the experience gained by the Westland Aircraft Works with their "Widgeons" Mark I, II and III, a modified version is being produced for 1929, which incorporates a number of improvements, chief among which is, perhaps, the introduction of a new type of undercarriage. The high-wing type of monoplane requires rather a wide-track undercarriage if ample stability on the ground is to be attained, and recent tests at Yeovil indicate that this has been achieved by the new design, in which the "crossed-axle" arrangement has been adopted. In this, the port axle (which is of the bent type) is hinged to the lower longeron on the starboard side and *vice versa*. One advantage of this arrangement is that the angle of the axle is reduced, the sharpness of the bend is also lessened, and most important of all, the axle itself is lengthened, with the result that for a given wheel travel (vertical), the change of lateral angle of the wheel is reduced. Thus a long travel can be provided without the wheel assuming "bow legged" angles with the load off the undercarriage and "knock-kneed" angles with the full landing load on the wheels.

The telescopic "leg" of the new undercarriage is the same in general principle as that which has now been employed on Westland light 'planes for a number of years.

The landing shock is taken on a strong steel coil spring, and bouncing is prevented by, as well as a certain proportion of the landing load taken on, a split sleeve with Ferrodo lining. As this split sleeve has adjusting bolts, the amount of friction can be varied to any required amount by tightening up the bolts. The wearing qualities of the Ferrodo lining are well known, and as there is no air pressure to maintain nor rubber to perish, the "leg" requires astonishingly little attention in service. An occasional greasing of the bearing points is all that is needed.

As each half of the undercarriage consists of a three-legged pyramid, with one strut going to its own lower longeron, the axle to the opposite lower longeron, and the telescopic leg to the top longeron, the landing shocks are extremely well distributed, and it has been found that stall-landings can be made without damage to machine or undercarriage.

Following the policy of making the "Widgeon" as near "fool-proof" as possible, experiments have been made with the Handley Page automatic wing tip slots, although it is claimed that even without them the "Widgeon," owing to its parasol wing arrangement and the wing section used, possesses many of the characteristics of the slotted wing in



FLIGHT TESTING NEW LIGHT 'PLANE ENGINE : These two photographs show the Westland "Widgeon" monoplane fitted with the A.B.C. "Hornet" engine. Note the neat cowling, which is completed by a spinner not shown in the photographs.

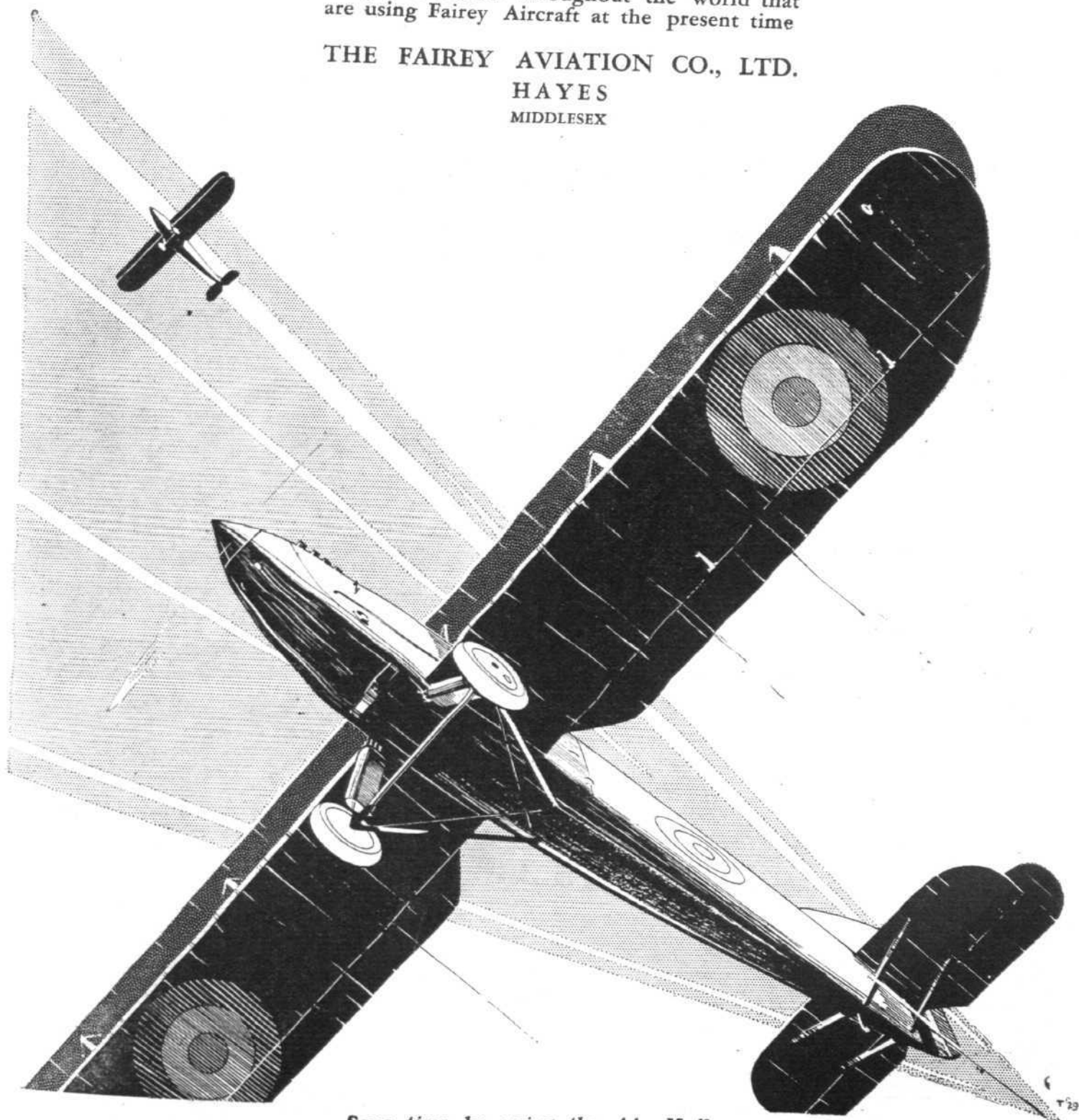
["FLIGHT" Photographs]

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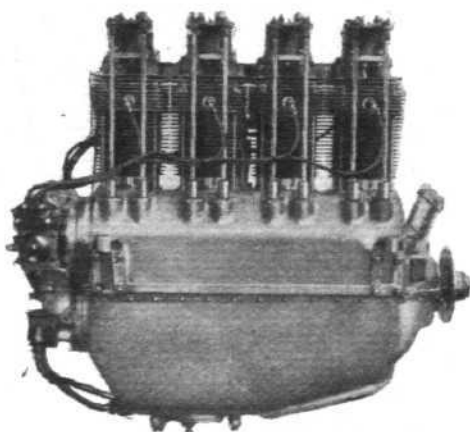
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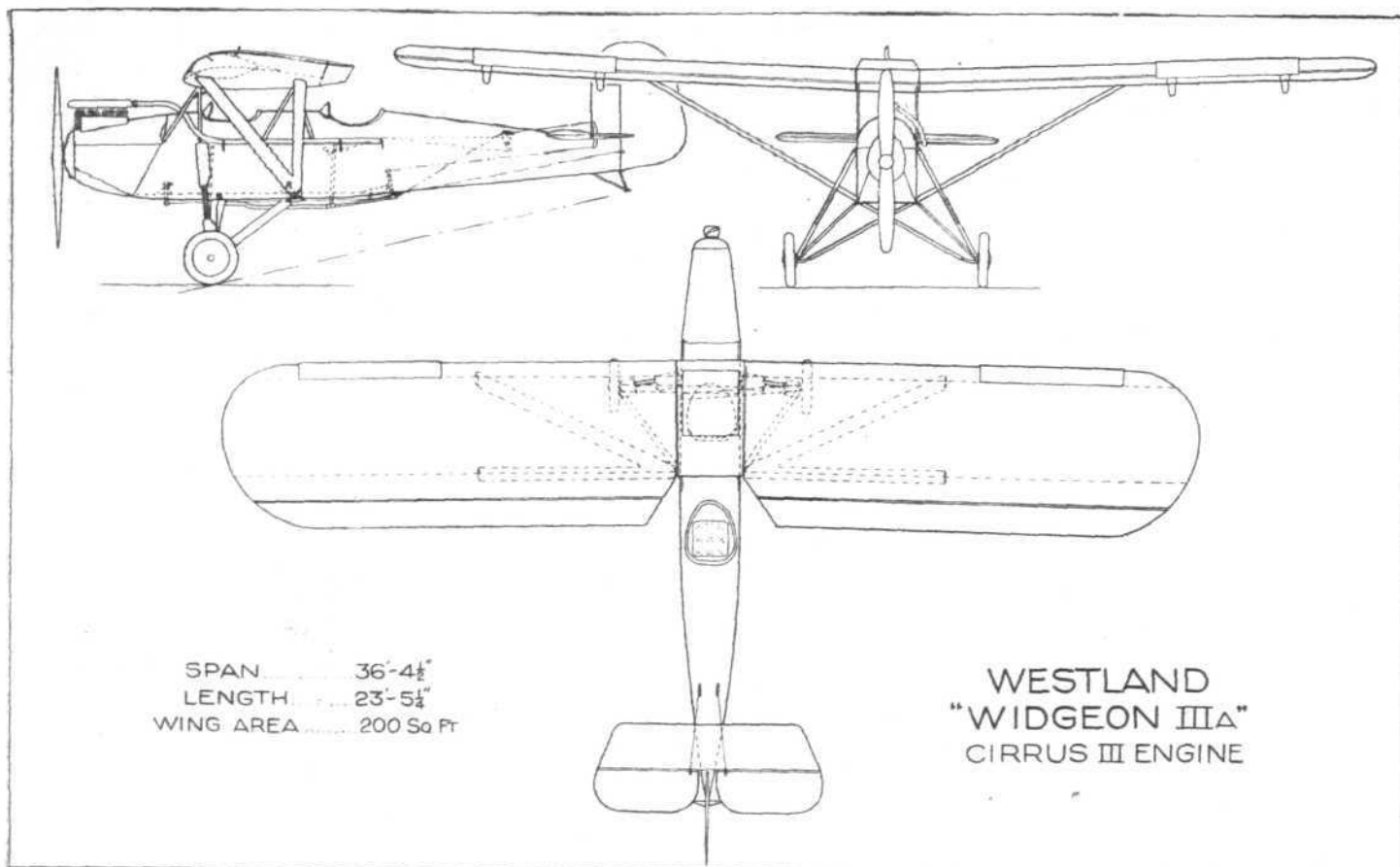
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The Westland "Widgeon IIIA" General Arrangement Drawings. The machine can be fitted with D.H. "Gipsy" or A.D.C. "Cirrus III" engine.

the stalled condition. As fitted on the "Widgeon" the auxiliary aerofoils of the slots are made of Duralumin sheet, bent to the contour of the nose of the main aerofoil. In the slot-closed condition, the auxiliary aerofoil rests snugly against the nose of the main section. The auxiliary aerofoil is attached by simple brackets and links, and supported near each end. A torque tube is incorporated in the system, and ensures the true alignment of the auxiliary aerofoil, as well as preventing it from twisting.

Although not standardised, the "Widgeon" coupé will be available in the immediate future to owners desiring this type of weather protection. Experiments have been made which indicate that it is possible to add a coupé top to the cockpit without any sacrifice in performance. In fact, the initial flying tests rather tended to show that the enclosed machine was, if anything, a little bit faster than the open.

Dimensions

The main dimensions of the "Widgeon III A" are as follows:—

Length o.a.	23 ft. 5½ in. (7.15 m.)
Wing span	36 ft. 4½ in. (11.1 m.)
Wing chord	6 ft. 0 in. (1.83 m.)
Wing area	200 sq. ft. (18.6 m. ²)

Width, folded	11 ft. 9 in. (3.58 m.)
Height	8 ft. 0 in. (2.44 m.)
Wheel track	7 ft. 0 in. (2.13 m.)

Weights and Performances

Weight of machine, empty	945 lbs. (430 kg.)
Total load carried (Normal)	705 lbs. (320 kg.)
Total load (Aerobatic category)	505 lbs. (230 kg.)
Loaded weight (Normal)	1,650 lbs. (750 kg.)
Loaded weight (Aerobatic)	1,450 lbs. (660 kg.)

When the "Cirrus III" engine is fitted, the fuel capacity is sufficient for 3 hrs. 40 mins. at cruising speed. The machine takes off in about 100 yards and pulls up in about 60 yards. The "Cirrus III" gives an initial climb of 600 ft. per min. and a service ceiling of 15,000 ft. The climb to 5,000 ft. occupies 9 mins., and an altitude of 10,000 ft. is reached in 22 mins. The landing speed is about 42 m.p.h.

An all-metal version of the "Widgeon" is now coming through the shops, and will be tested during the next few months. Details of its fuselage construction were published in FLIGHT of February 28, 1929. Recently, a Westland "Widgeon" has been fitted with the A.B.C. "Hornet" engine, and flight tests are now in progress.

CINQUE PORTS EASTER MEETING

Many Entries and Good Programme

THE entry lists for events at Easter do not close until Friday evening next, the 15th, but already a large number of entries have been actually received or promised. Among these are:—10 "Moths," 2 "Widgeons," 3 "Avians," 3 "Panders," 2 S.E.5's, 1 D.W. (1), 1 D.H. 53, 1 A.N.E.C., 1 "Blackburn," and possibly 3 "Spartans." In addition there will be the two club machines and two Avros from the Brooklands School of Flying, all of which will be reserved entirely for joy riding.

Many improvements in respect of the comfort of both competitors and spectators have been made on last year's arrangements, and in particular, elaborate arrangements have been made for a good lunch and tea service at reasonable prices, and also an efficient loud speaker equipment will provide news and music.

It seems probable that the most important event, *i.e.*, Manufacturers' scratch race for our Vice-President's (Sir Charles Wakefield, Bart.), 20 guinea cup, will be well supported by the trade, and should give the public a really representative idea of the capabilities of standard light aeroplanes, which can be purchased in the market, and the variety at its disposal.

Exhibitions of aerobatics will be given by Capt. Hubert Broad, M.C., and Capt. Neville Stack, A.F.C., so that thrills can be guaranteed.

We are glad to note that the Suffolk Club will support our meeting, and shall be glad to receive entry forms from them before the closing date.

Intending visitors are again reminded that the entry lists close on Friday next, 15th, at 8 p.m.

EDDIES

THAT must, indeed, have been a unique experience of Vicomte and Vicomtesse de Sibour, who are flying round the world, which they have released, in connection with a forced landing south of Basra, during a scrap between Arab raiders and the R.A.F. at the end of last year. Their landing, it appears, was caused by engine trouble, and as soon as their crippled "Moth" touched ground, the Arabs made a rush for it. The R.A.F. machines, however, at once set up a barrage of bullets in a circle round the disabled machine, keeping the raiders at a distance.

For half an hour the Vicomte and Vicomtesse sat in the cockpit of the machine, with bullets raining around them, at the end of which time the Arabs scattered, and an army lorry was brought up to tow the machine back to Basra.

Mr. Selfridge must have been well pleased when he heard of his son-in-law and daughter's rescue under these conditions.

M. LAURENT EYNAC, the French Minister for Air, has not only again placed his ban upon ocean flights, but has now wisely suspended all authorisations for long-distance flights until he is satisfied that failures are less likely to occur than of recent times in connection with the efforts of some of the French adventurers.

MR. E. B. FIELDEN, M.P., Deputy Chairman of the L.M. & S. Railway, last week made it very plain, at a special meeting of the company, that the railway companies are treating seriously their applications for powers to provide new aircraft for the conveyance of passengers and merchandise to or from aerodromes situated in districts to which access was afforded by the railways, in addition to providing aerodromes, hangars, garages, and similar accommodation. Which all sounds healthy for the future of aviation, but, at the same time, it is to be hoped that any extension of their powers in the form of construction of machines and engines to the detriment of the hardly-won aeroplane industry will be scotched, and very emphatically at that.

"WHEN the Devil was ill, the Devil a saint would be; when the Devil was well, the Devil a saint was he." Thus Germany, the first country to utilise poison gas in war-time, hoping thereby to win, now solemnly announces, through her Foreign Minister, to the League of Nations, her intention to ratify the prohibition of the use of poison gas in future. Just so, and then when war does happen to start, what about another "scrap of paper"?

SIR DOUGLAS MARSON appears to be getting well forward with his arrangements for the new Antarctic expedition which is to be under his leadership. Of course, the main object is oceanographical investigations combined with a coast-line survey. Although it appears Sir Douglas has not definitely made up his mind in regard to the use of aircraft, his views appear to be that on the general question, the aeroplane was hardly likely to do away with the old form of exploring, but it would help and simplify such work. In that respect, it might be that some regions held nothing of importance, and the aircraft survey would reveal this, and it would then be unnecessary to embark on perhaps long, fruitless sleigh journeys, which is, of course, good, sound common sense. After all, the most valuable lessons from experience are those which teach what *not* to do, and so the enormous wasted energy which the aeroplane will thus save must be a big asset to an expedition, and incidentally, another great tribute to aircraft.

VERY imposing is the Underground Railway skyscraper in Broadway, Westminster, and judging by a reproduction of one of the panels adorning the building, which, in this case, represents "Wind," it is a good job if such "art" is skied! Am just wondering whether it represents N., S., E. or W. It would be well to know, so that flyers might dodge such a ghastly looking element.

AS usual, the Labour Party are out again over the Air Force Estimates for their usual demand for aerial disarmament, with the unreasonable suggestion that this country should lead in the initiative for the abolition of air forces and international control of civil aviation. This

time the movement is in the hands of Mr. Bellamy and Mr. Malone. And what a gospel of perfection it is! It would be well if these quaint would-be reformers let their minds hark back a moment to August, 1914, when the peace "scrap of paper" was metaphorically torn up, and then ponder the results of their suggested ideal of our being unprepared. No, it is the old, old problem of first re-adjusting human nature. And that may arrive in a few hundred thousand million years or so hence. Therefore, instead of dangerous idealised views, in our strength let real peace security rest.

IN an article in the *Evening Standard* recalling the Road Monarchs of the old days, in the form of horse 'buses, some very interesting memories are revived for old-timers in regard to their customs and the amazing improvements that have since been incorporated in the London traffic problem, the expressed opinion of many, when the motor 'buses were first introduced, being summed up in their refusal "in any shape or form to use these beastly, oil-smelling bone-shaking and unsafe" contraptions. By way of a conclusion, it is suggested that something like that may be said of the first aerial 'buses.

LIKE the old horse 'bus, this no longer applies to passenger-carrying aircraft, the cabins of up-to-date machines becoming yearly more and more luxurious. One thing, at least, the aerial 'bus has never had to go through the experiences of its early transport rival in the form of evil-smelling bicycle lamps (a single one at one end in each 'bus at that), straw-strewn floors, etc., although the first aerials certainly "confessed" to something like the knife-board ladders of the ancient 'bus. One item the *Evening Standard's* humorous history recorder omitted was an even earlier horse self-starter than the conductor's bell, viz., the one-time banging of the 'bus door, which, needless to say, was also responsible for many a facetious remark in the days gone past.

SANTOS DUMONT as a pioneer in aviation assisted in making history in that connection. Now he has turned his attention to a mechanical ski—which *seems* a bit weird. I'm just wondering what would happen in a crowd if the ski-motor suddenly took charge with a novice!

LAST week a very impressive and enjoyable re-union took place at Carpenters' Hall, which is London Wall way, of the Master, Wardens and other personages attached to the Worshipful Company of Coachmakers and Coach Harness Makers, which Livery ceremony was also graced by the Lord Mayor, the Sheriffs and others to the full capacity of the very beautiful hall of the Carpenters' Company—with W. J. McCormack in the Master's Chair. What a change over from old-time gatherings! Here were quite an assembly of the best—that is, best in the human line—in the motoring fraternity and quite a sprinkling of aviation giants. It looks as if the move of recent years to attach both these sides of coachwork to their body has been more than justified by results, and from what I hear quite a number of other aeronautical men are fluttering around with the idea of securing a good landing in the Company's magic circle. Many of the guests, although not of aviation, were, more or less, intimately interested in matters aeronautical.

MAILS only—no, *not* males—are to be carried for the first month on the London to India air mail route opening on March 30.

THE estimation in which aviation journals are held in the United States is well exemplified by the institution of an "Air Journal Reading Service" by the Spartan Aircraft Co., of Oklahoma. Their example is one which might well be expanded. The scheme is to keep the company's key men posted with the progress of the industry as described in the various publications subscribed for by the company. Each department head will find that articles which particularly concern his work will be marked for him, and they will be able to keep each magazine for two days. This method will save department heads time in scanning magazines for the articles most interesting to them. The air journals have been chosen from many countries, and from the most prominent—including, of course, *FLIGHT*.

AEOLUS

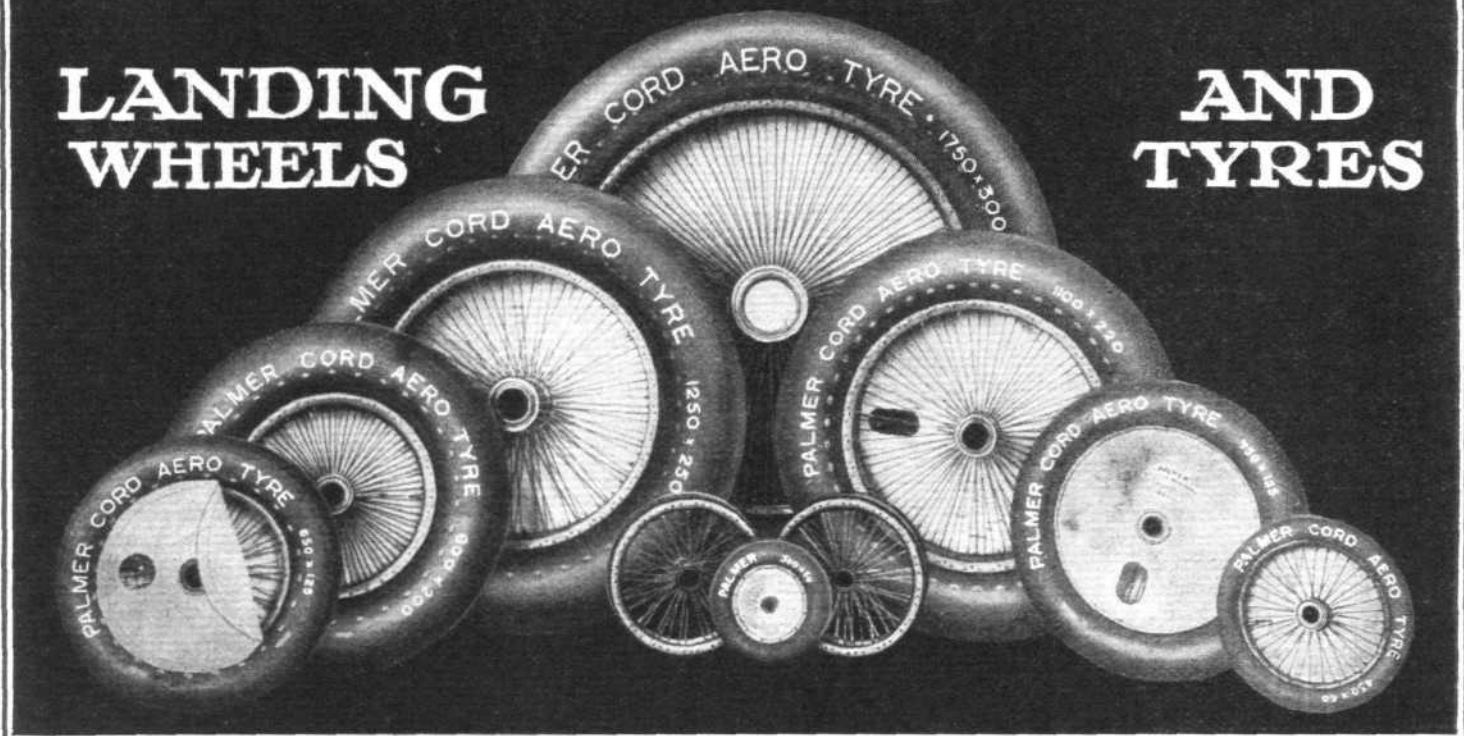


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Tyre Size	Wheel No.	Hub		Track Line	Tyre Size	Wheel No.	Hub		Track Line	Tyre Size	Wheel No.	Hub		Track Line
		Length	Bore				Length	Bore				Length	Bore	
575 x 55	168	m/m 111'12"	m/m 25'4"	m/m Central	700 x 100	176	m/m 178'	m/m 44'45"	m/m Central	1000 x 180	149	m/m 220'	m/m 80'	m/m Central
"	195	130'	38'09"	Central	"	179	178'	55'	132/46	"	149	185'	55'	Central
300 x 60	16	111'12"	25'4"	Central	650 x 125	119	178'	55'	132/46	"	155	220'	66'67"	Central
450 x 60	30	89'	31'75"	Central	"	147	178'	55'	Central	"	166	185'	55'	125/60
"	172	130'	38'09"	Central	"	188	120'	34'92"	132/46	900 x 200	107	185'	55'	Central
575 x 60	21	160'	28'	Central	"	336	178'	44'45"	132/46	"	108	185'	55'	125/60
"	180	150'	38'09"	104/46	750 x 125	77	178'	44'45"	132/46	"	128	220'	66'67"	Central
"	186	120'	34'92"	Central	"	92	185'	55'	135/50	"	137	250'	80'	Central
"	190	150'	38'09"	Central	"	95	185'	55'	Central	"	157	185'	80'	Central
600 x 75	21	160'	28'	Central	"	99	178'	38'89"	132/46	"	202	185'	60'32"	Central
"	180	150'	38'09"	104/46	"	112	150'	38'09"	Central	1100 x 220	134	220'	66'67"	Central
"	186	120'	34'92"	Central	"	176	178'	44'45"	132/46	"	136	250'	80'	Central
"	190	150'	38'09"	Central	"	179	178'	55'	132/46	975 x 225	192	185'	60'32"	Central
700 x 75	78	178'	44'45"	132/46	800 x 150	161*	185'	55'	135/50	"	194	185'	55'	125/60
"	79	178'	44'45"	Central	"	162*	185'	55'	Central	1250 x 250	314	250'	80'	Central
"	100	178'	38'09"	132/46	"	163*	185'	66'67"	135/50	"	154	304'8"	101'6"	Central
"	101	178'	31'75"	132/46	"	169†	185'	55'	135/50	1500 x 300	305	304'8"	152'4"	Central
"	196	178'	55'	Central	"	177	185'	55'	135/50	"	306	304'8"	101'6"	Central
600 x 100	188	120'	34'92"	Central	"	183	185'	55'	Central	1525 x 325	197	304'8"	101'6"	Central
"	304	150'	38'09"	104/46	"	211*	185'	60'32"	135/50	1750 x 300	139	400'	152'4"	Central
"	333	120'	34'92"	Central	1000 x 150	167	185'	55'	125/60	"	191	350'	150'3"	Central
700 x 100	77	178'	44'45"	132/46	"	174	250'	80'	Central	1750 x 350	193	400'	125'	Central
"	92	185'	55'	135/50	"	182	185'	55'	Central					
"	95	185'	55'	Central	"	187	220'	66'67"	Central					
"	99	178'	38'89"	132/46	"	201	185'	60'32"	125/60					
"	112	150'	38'09"	Central	"	210	185'	60'32"	Central					

*Wheels Nos. 161, 162, 163, and 211 are of stronger type than the other wheels for 800 x 150 tyres.
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†Wheel No. 169 is fitted with Ball Bearings (L/NB)

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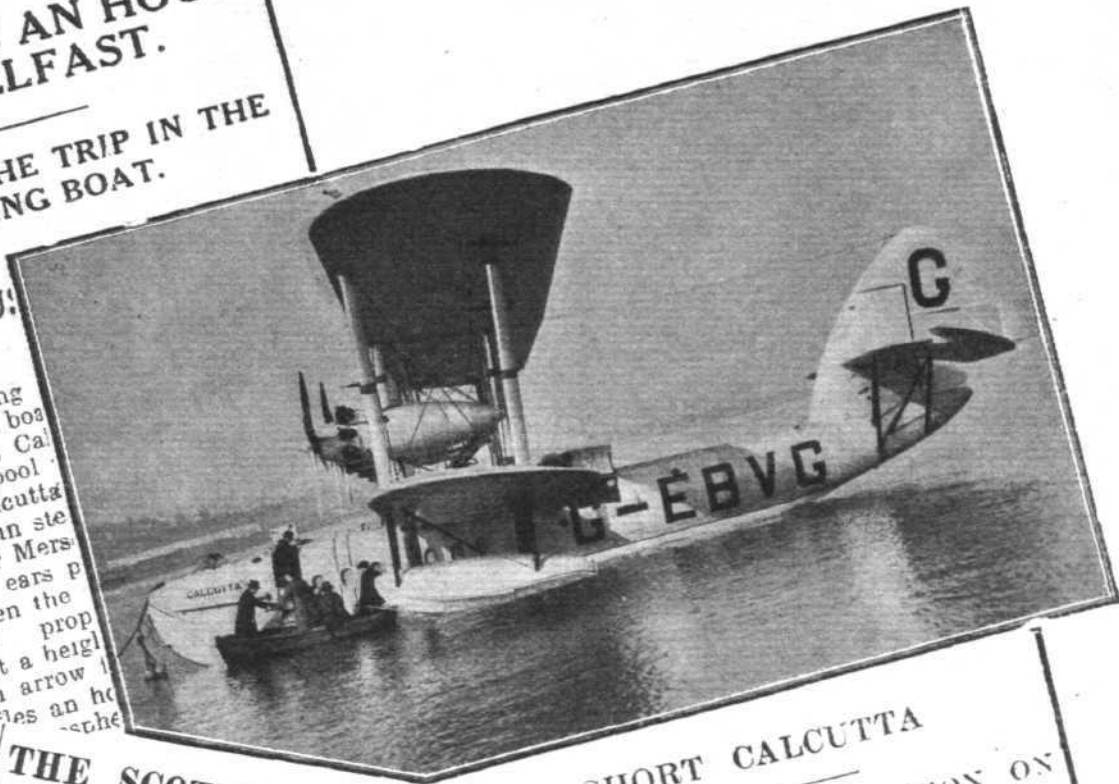
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An Evening
who was on board
flying boat, Calcutta
first Liverpool
The Calcutta
and rose in the
the River Mersey
as, with ears popping
to deaden the
engines' propellers
ward at a height
like an arrow
100 miles an hour
The
astro
der



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BY AIR.

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Calcutta, which
operate over the
India, has been
by its chairman,
days' pleasure
board of Great
The boat, which
passengers besides
three, will take
his three sons,
Isobel Goring, Miss
Colonel and Mrs. F. R. I
will leave Imperial Airways
Southampton next Friday
flying via Weymouth
arrive at Tenby as
flight will continue
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To Guernsey by A.

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been placed by
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THE BRISTOL "JUPITER" FAMILY—(V)

IN our issue of December 6, 1928, we concluded a series of articles describing and illustrating the details of the design and construction of the Bristol "Jupiter" engines. In the present issue we bring the series to a close, with a few notes on the mounting, installation, equipment, etc., of the "Jupiters." The illustrations accompanying the present article are mainly diagrammatic, since it was concluded that prospective users of the "Jupiter" would not, in any case, design the details of their installation from such small drawings as we are able to publish, but would obtain detailed working drawings from the Bristol company. It is thought, however, that our diagrammatic drawings may be found of interest in showing the general "scheme" in outline.

While leaving users of the "Jupiter" engines, a free hand in designing their installations, the Bristol Company are always ready to give advice and suggestions, and it has, for many years, been one of Mr. Fedden's strong arguments, that if an engine is to work at its best, and consequently give the greatest degree of satisfaction to its user, the engine designers should be allowed to make suggestions in connection with the installation. The following notes are based upon advice and suggestions which the Bristol Company issue to their customers, and should therefore be of considerable value to present and prospective users of the "Jupiter."

Mounting and Cowling

The mounting must be stiff enough to support the engine without serious deflection under all flying conditions, and to withstand the torque variation. The stiffness of the mounting will be affected by the distance from the centre line of the engine to the bulkhead, and this distance should be kept to a minimum consistent with the accessibility to the rear cover units, such as oil filters, magnetos, heater pipes, etc.

The mounting should preferably be stayed in all bays, rigid tubular struts being preferable to bracing wires. A typical mounting is shown on the left, in the diagram below.

Torque reaction is anti-clockwise looking on the front of the mounting, and where rigid struts are used in the side bays, they should, as a rule, be arranged in compression, as the weakest portion is usually the joint between the strut and the securing lug.

In practice, for convenience, it is generally preferred to keep these struts in similar positions, one being in compression and one in tension, and the one in compression should be treated for buckling loads.

INSTALLATION, EQUIPMENT, ETC.

The engine plate should be flat and true with the crankcase face. To prevent any tendency to panting or buckling, it should be of a suitable stiffness, and the unsupported area between the mounting bolts and the support attachments should be kept to a minimum, and flanged where possible.

The actual thickness of plate will vary with the area, the material, and the amount of stiffening; for a plain steel plate of small area, the minimum gauge advised is 12 S.W.G. (0.104 in.), for Series VI and VII, and 10 S.W.G. (0.128 in.) for Series VIII, IX and XI.

With metal mountings, packing washers will usually be required under the mounting bolts securing nuts, and care should be taken that the area of these is sufficient to ensure the pressure being distributed over the crankcase face, and not on the counterbore; otherwise, local buckling will take place, and the engine will quickly work loose.

Particular attention should be paid to the fit of any pins, bolts or rivets, and the various joints should be absolutely firm and free from play; weakness in this respect will develop very rapidly under running conditions.

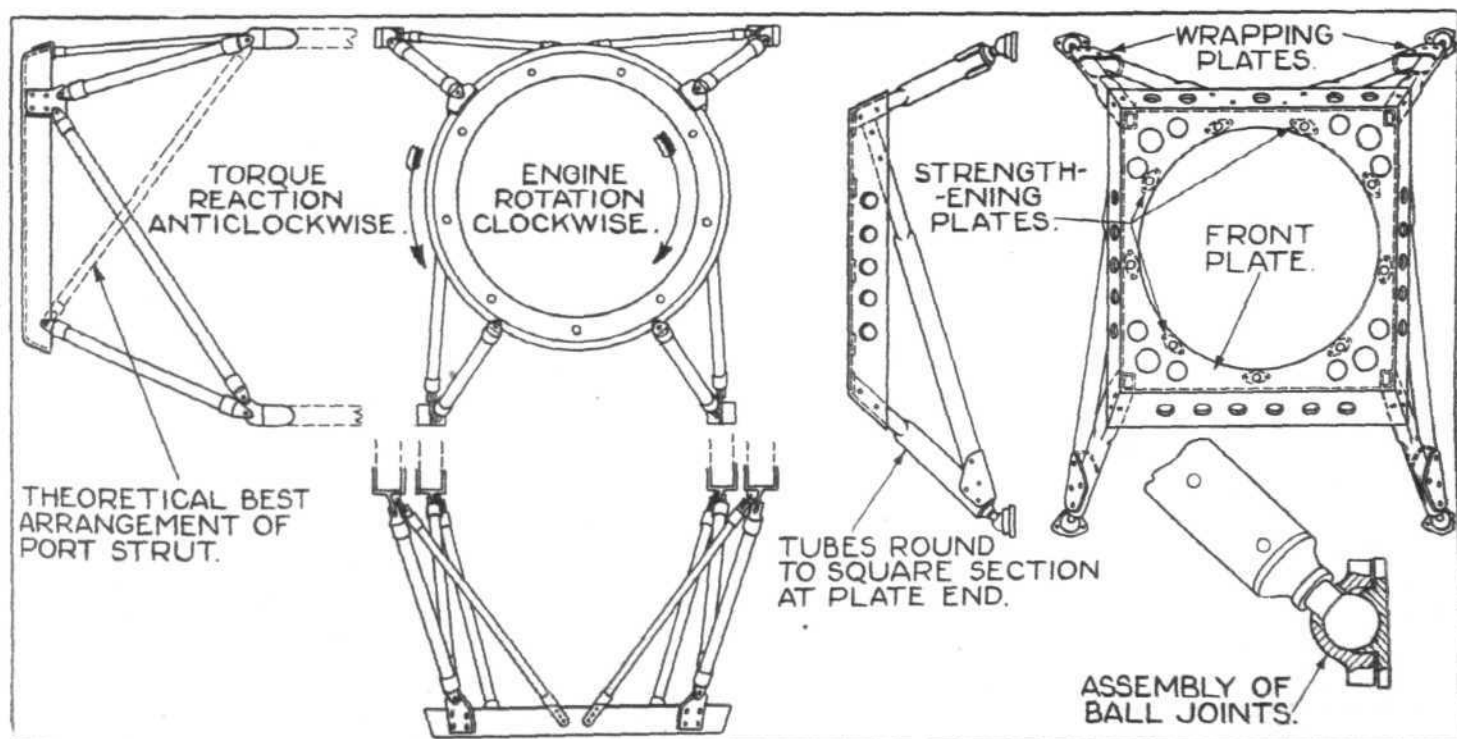
If the mounting is of a detachable type, attached to the fuselage by pin joints, these must have sufficient bearing area, and should preferably be a ground taper fit.

As the bearing area required will be considerably more than that necessary from purely strength consideration, large diameter hollow pins are preferable.

The diagram on the right shows a particularly good example of an attachment joint of the spherical type, giving good bearing area and sufficient freedom to ensure interchangeability.

Jupiter Mounting Design Data

"Jupiter" Series	VIA	VII	VIII, IX and XI
Maximum propeller r.p.m.	1,870	1,950	1,100
Maximum b.h.p.	485	460	525
Weight bare, less propeller and hub lbs.	720	760	880
Polar mass moment of inertia			
lbs. ins.	147,500	147,500	150,000
Mean torque lbs. ins.	19,100	19,100	38,200
For members subjected to shear equivalent static torque			
lbs. ins.	108,200	113,000	224,000
For members subjected to tension or compression :—Equivalent static torque lbs. ins.	54,100	56,500	112,000



TWO TYPICAL "JUPITER" MOUNTINGS: On the left a tubular mounting, preferred to one using bracing wires. On the right is shown a mounting for the type VI engine, in which use is made of a spherical attachment joint.

For any member subject to both shear and bending to any considerable extent, it is advisable to work to shear figures given above.

Polar Mass Moment of Inertia.—This is given to assist the aircraft designer in determining the effect of the engine mass on :—

- (a) The damping out of the engine torque fluctuation.
- (b) The synchronisation with the engine impulses of the mounting natural period of torsional vibration.

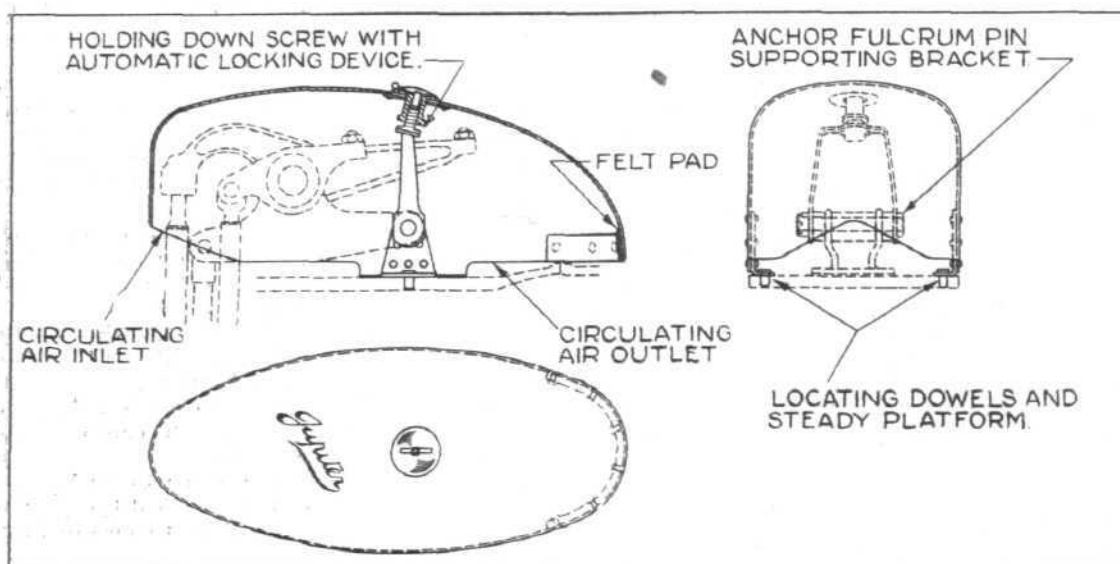
Equivalent Static Torque.—The stress imposed by the

The securing strap has a quick release, automatic locking fastening enabling the cover to be quickly removed for rocker adjustments, etc.

Cooling air is admitted by the cut away front portion and after circulating round the rockers, passes out at the rear between the inlet pipe branches.

Propellers

The standard propeller hub supplied with the Bristol "Jupiter" is suitable for wooden propellers, but a Bristol-type hub suitable for detachable and adjustable metal blade



The "Jupiter" Rocker Helmet : This has been standardised to fit all three Series VI engines, as well as the Series VII, VIII, IX, and XI types.

torque reaction is the most important factor to be considered in stressing engine mountings, being much greater than that imposed by propeller pull or engine weight.

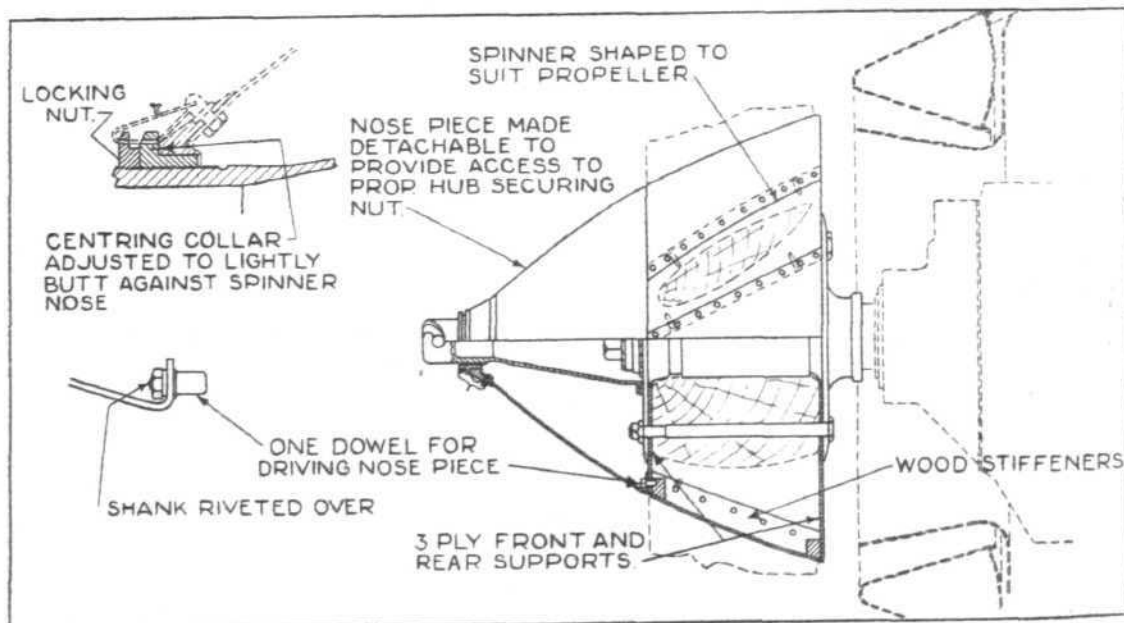
The torque diagram of the Jupiter has nine equal-spaced peaks in each two revolutions, and therefore for stress calculations, the mean or maximum torque does not give a true indication of the actual stress imposed; for this purpose, the equivalent static torque, which takes into account the effect of torque fluctuation, is required. It should be noted that the effect on members in shear is twice that on members in tension.

propellers can be supplied, the general arrangement being shown in one of our diagrams.

A special hub, similar to the standard hub for wooden propellers, but without the radial serrations, and with a special ground finish to the driving flanges, is supplied for use with Reed-type metal propellers.

These propellers, if used, must be of the latest pattern, with thick blades, and with the boss forged integral with the blades, or the blades fitted with metal packing blocks. The holes should be jig drilled and a good fit on the bolts. The use of the old type, built with wooden packing blocks in

Diagram of "Jupiter" spinner, integral propeller boss type.



Rocker Cowling

The rocker cowling consists of a light aluminium pressing, arranged to cover completely the valves and rocker gear, and is intended to protect these components from foreign matter, and also to trap any surplus oil which may exude from the rocker bearings, and prevent it being thrown back on the pilot's windscreen.

One pattern is available suitable for all "Jupiter VI.A," "Jupiter VII," "Jupiter VIII," "IX," and "XI" engines, which are already drilled to receive the dowels used for locating the helmet, and fitted with the special extended-type fulcrum pin, to which the securing strap is attached.

conjunction with thin section twisted blades, is not recommended for "Jupiter" engines.

For the "Jupiter VI," and "VII," a two-bladed propeller will be found most suitable, while for the geared engines either a two- or four-bladed propeller can be used.

The design should ensure a reasonable slipstream velocity near the root, which should be of stiff section.

The Propeller Department of the Bristol Company are prepared to design and supply suitable propellers for all types of Bristol engines.

All propellers must be carefully balanced and checked for track and pitch before use, and the recommended boring

Hawker Horsley
Torpedo Carrier



ROLLS-ROYCE

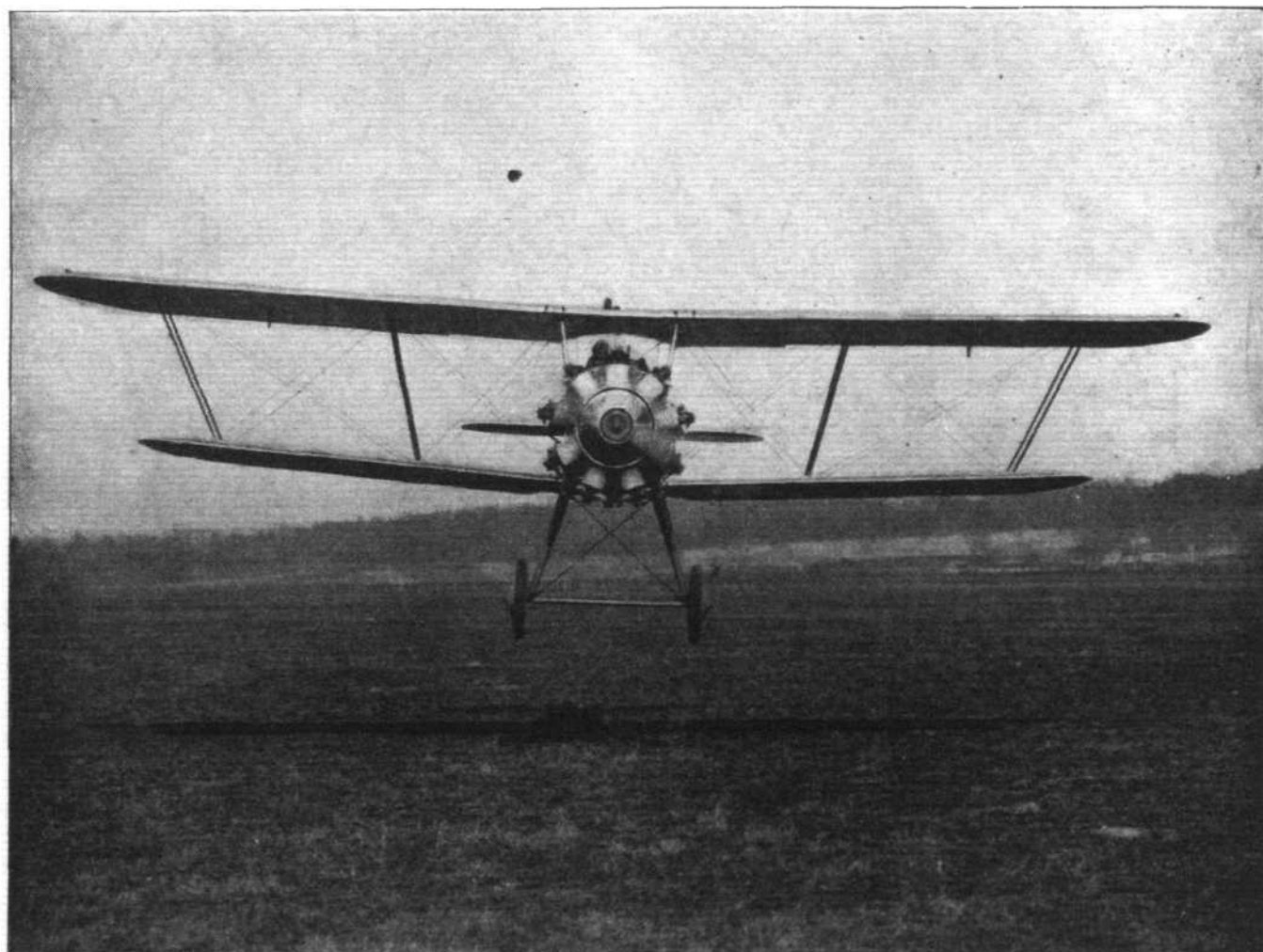
AERO ENGINES

[“FLIGHT” Photograph.]

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THE HAWKER HAWFINCH

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[“FLIGHT” Photograph]

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sizes adhered to; the propeller must seat freely and truly upon the hub.

Spinners should be used on Series VI-VII engines, as they serve to fair off the cowling and to direct the air flow around the exhaust ring deflector and crank-case.

Two-piece spinners are essential, the nose piece being made easily detachable to permit ready access to propeller bolts which require attention in service.

For wooden propellers the integral type spinner, built up with the boss and using a detachable metal nosepiece, is the most convenient, serviceable and easily fitted.

Exhaust System

For the benefit of aircraft constructors, it is the policy of the Bristol Company to develop, test and standardise for each type of engine a suitable exhaust system, which will act as an exhaust collector, flame damper and silencer. In addition, provision is made for utilising the exhaust ring as the front support for the engine cowling. The latest types, evolved as the result of extensive bench and flight tests, supersede all earlier types.

Deflector rings are provided to ensure a steady flow of air around the rear of the ring, preventing hot spots and stagnant areas, and, in conjunction with the special expansion joints, eliminate all fire risk.

These rings have been type-tested, and the detail design and dimensions are such that back pressure and consequent loss in brake horse-power is negligible. The Fescolizing treatment given the exterior makes them proof against corrosion, from heat and atmospheric effects, with the result that the life of the rings is indefinitely prolonged.

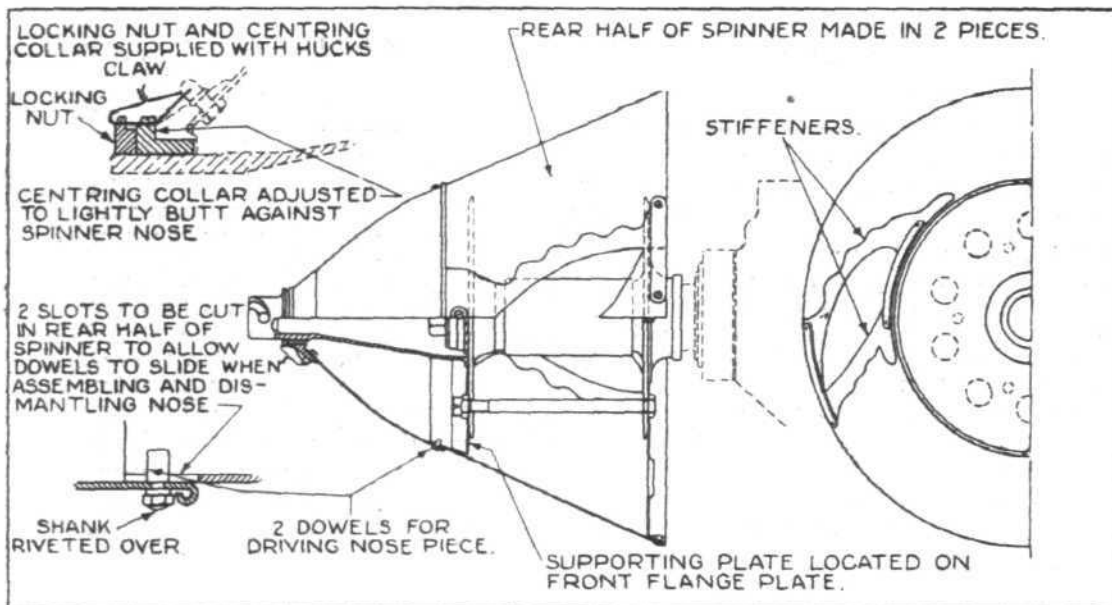


Diagram of spinner for "Jupiter VII."

At the present time these exhaust systems are available in two types, one suitable for all types of "Jupiter VI" engine installations, and one for all types of "Jupiter VIII," "IX," and "XI" installations. For the supercharged "Jupiter VII," an exhaust system is not yet available, the engine operating with short exhaust snouts.

"Jupiter VI.A" Exhaust System.—A deflector ring is fitted to ensure a steady flow of air around the back of the exhaust ring; this provision is a most important one, and must not be negated by unsuitable spinner design. Special screwed spherical joints are provided to ensure a flame-tight joint, combined with reasonable freedom for assembly purposes to ensure interchangeability of rings. The complete ring and fittings weigh 65 lb., and the reduction in horsepower with this ring when correctly installed does not exceed 1 per cent.

"Jupiter VIII," "IX," and "XI" Exhaust System.—One of our diagrams shows the arrangement of the ring, which, in principle, is similar to the Series VI, but of different contour to suit the extended nose of the geared engines. The weight of the ring, complete as shown in the diagram, is 55 lbs., and the drop in horsepower does not exceed 1 per cent.

FUEL AND OIL SYSTEMS

Standard Air Intake.—A standard air intake has been produced for general use on the "Jupiter VI," "VIII," "IX" and "XI" engines. It is arranged to draw warm air off the lower cylinders. Additional heating is provided by the hot oil from the engine sump, which circulates through the air

intake elbow on its way to the scavenge oil pump. The elbow is internally ribbed to promote the flow of heat to the intake air.

Seaplane or Desert Type Air Intake.—An upwardly pointing extended type of air intake has been produced, intended for use where foreign matter, such as water, sand, etc., would be liable to be drawn into the standard type air intake. The aluminium casting, complete with flanges for securing the extension, is supplied by the Bristol Company to order; the extension must be made up to suit the installation, and is not supplied by the Bristol Company.

Carburettor Controls.—Owing to the non-uniform response of the butterfly throttle as used on the Bristol "Triplex" carburettor, particular care should be paid to obtain the differential action so that the engine response will be sensibly uniform with the movement of the pilot's control. The altitude control is interconnected with the throttle, and is automatically returned to ground position when the throttle is shut.

For high compression or supercharged engines the amount of throttle opening at sea level when using standard fuel is limited to prevent detonation; the maximum amount of opening is indicated by a pointer registering with a marked plate on the starboard side of the carburettor, and it is essential that a suitable form of gate throttle, with the gate so adjusted that it corresponds with this opening, is provided.

On machines where altitude control is not required, provision can be made for adapting the altitude control to serve as a mixture weakening device.

Carburettor controls of a type suitable for commercial

aircraft, where the machine is normally flown at a constant throttle opening, are produced, and a type suitable for long-distance machines, where, owing to the reduced load consequent on fuel consumption, the throttle is gradually closed as the flight proceeds, is also available. Both these systems are automatic in action.

The Bristol Triplex Carburettor. Automatic Mixture-Weakening Device

On this carburettor the main jet is of the variable type, consisting of a cylindrical rod or needle sliding in a housing, taper grooves around the circumference of the needle communicate with the fuel in the float chamber and register with holes in the housing communicating with the jet well.

The needle can be raised or lowered by rotating the operating sleeve which engages with a quick start thread cut on the outside of the needle guide, thus increasing or decreasing the equivalent jet sizes.

A numbered dial on the top of the operating sleeve indicates the amount of movement; this can be controlled in flight to provide altitude control, or an economical cruising setting by levers clamped on the sleeve and interconnected with a single control lever.

For commercial machines, or where altitude control is not required, an automatic economical throttle setting can be provided, the single control lever being held by a spring against a cam mounted on the throttle lever. This cam moves with the throttle lever and is so shaped that at one definite throttle setting the mixture is automatically weakened

a definite amount, but that at all other throttle openings the normal mixture is provided.

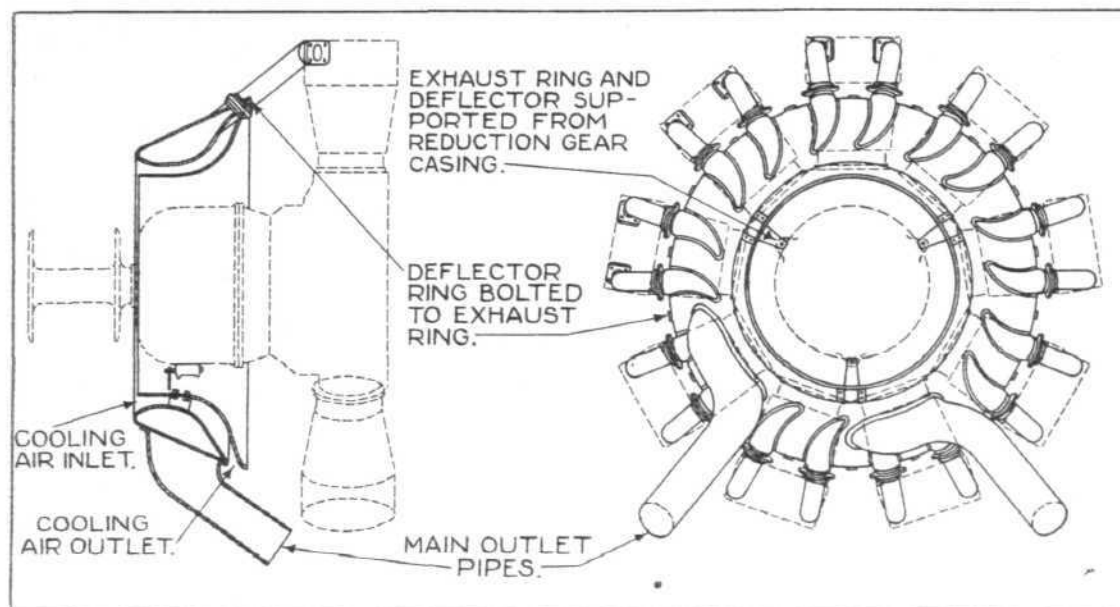
To prevent the possibility of a flat spot when opening up for taking off, etc., the control lever is connected up to a cockpit control, and can be kept out of action when desired.

The throttle position at which the weakening device comes into operation can be arranged to suit the desired cruising setting; the amount of weakening obtained is fixed as determined by bench tests and prevents any possibility of damage to the engine through running on too weak a mixture, while the automatic action relieves the pilot of all

provision must be made for priming the pump when starting. Although the pump will function up to a greater head, it should be remembered that the maximum permissible head for the carburettor feed is approximately 12 ft.

The installation must provide for petrol to be circulating through the pump at all times when the engine is running.

The relief valve supplied as a separate unit for mounting on the bulkhead or other convenient position is intended for use when the pump feeds the carburettors direct, petrol delivered in excess of the engine requirements being bye-passed back to the main tank or suction side of the petrol pump.



"Jupiter" VII, IX and XI exhaust system diagram.

worry from this source. For long endurance flights a special development is used, owing to the progressive closing of the throttle as the flight proceeds.

The Bristol Engine-Driven Petrol Pump

The Bristol engine-driven petrol pump is of the well-known gear wheel type, as developed by the British Royal Aircraft Establishment. The pump gives a non-fluctuating flow, and all bearing surfaces are automatically lubricated by the petrol circulating through the pump, leakage along the driving shaft being prevented by a spring-loaded, cork-packed gland.

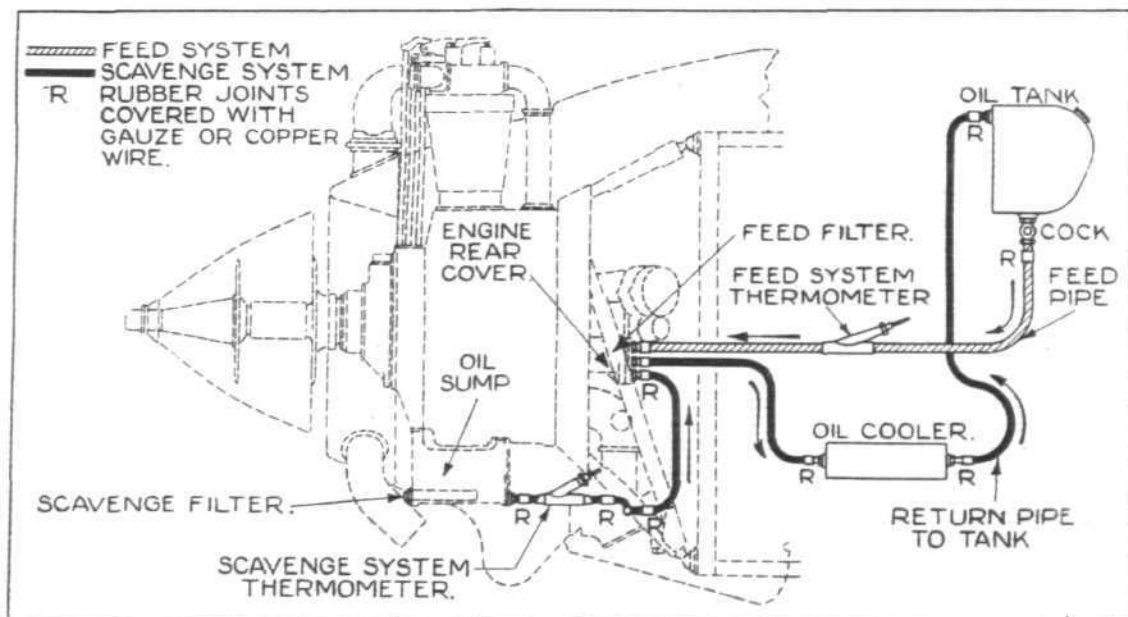
Lubrication System

On all "Jupiter" engines the oil tank should be located so that the bottom of the oil tank is not lower than 20 in. below the engine centre line when the machine is in the tail down position; the positive head is unlimited.

All oil pipes are $\frac{1}{2}$ -in. diameter, except the feed pipe from tank, which must be 1-in. diameter, to ensure a free flow to the engine when starting up under cold conditions.

Unless the oil level with full tanks is below the engine feed connection a 1-in. shut-off cock must be included in the feed pipe from tank to engine to prevent oil leaking through the pump on a long stand by, and flooding the lower cylinders.

"Jupiter VI A" oiling system diagram.



This pump is standardised on the "Jupiter" Series VII, VIII and IX engines, being positively driven from the gun gear drive shaft, the pump being mounted on the induction elbow in a conveniently low position. The pump runs at half engine speed and delivers approximately 100 per cent. in excess of the engine requirements.

The delivery under varying heads is sensibly constant, and the pump will maintain its output under a combined suction and delivery head up to 30 ft. The suction lift should not exceed 20 ft., and as the pump is not self-priming, in all cases where the pump operates with a suction lift,

As a safeguard against the possibility of the engine being run with the oil turned off, the oil cock should either be interconnected with the petrol cock controlling the feed to the carburettors, so that the oil is automatically turned on with the fuel supply, or connected up with the magnetos, so that when the oil cock is shut the magnetos are earthed.

Where the oil is interconnected with the petrol, instructions should be placed in the cockpit against shutting off the petrol while taxiing in, as in this case the engine might be running for several minutes with the oil shut off.

Owing to the shortness and comparative rigidity of the

piping, flexible connections between the engine and the bulkhead are essential, in order to relieve the engine union of any vibrational movements tending to unscrew it. This is particularly important with the large diameter oil-feed pipe.

Rubber connections are suitable, provided they are wrapped with metallic gauze, wire or asbestos, to comply with the requirements of the Fire Prevention Committee.

To check oil temperature, especially on new types of machines, the use of oil thermometers is essential.

These should preferably be of the Mercury Invar type; one should be fitted in the oil scavenge pipe line, between engine sump and oil-heated elbow, and another in the oil feed pipe line from tank to engine.

The installation should be carefully carried out to ensure that the thermometer is actually in the oil stream, and also that a local restriction is not caused.

Pressure gauges should read up to 60 lbs. sq. in. for "Jupiter" VI and VII, where the normal oil pressure is 40 lbs. per sq. in., and up to 80 lbs. sq. in. for the "Jupiter" VIII, IX and XI, where the normal oil pressure is 60 lbs. per sq. in. Gauges should be of the overload type, to allow for high pressures generated when starting with cold oil.

Oil Coolers.—On all "Jupiter"-engined machines, provi-

high pressures generated when starting up under cold conditions.

Oil System

The Amyot Pressure Relay.—With this system, the engine lubricating oil is not used to transmit the operating pressure from the engine to the gauge in the cockpit; instead, a special bellows mechanism is fitted to the engine pressure gauge connection, and a flexible pipe, filled with a special transmitting fluid, relays the pressure to the cockpit gauge. The outstanding advantages of the system are:—

- (1) That rupture of the relay pipe does not permit the engine lubricating oil to escape; and
- (2) The transmitting fluid, unlike lubricating oil, remains of approximately constant and low viscosity over the whole range of operating temperatures, therefore the time lag customary without the Amyot system when starting from cold is obviated.

These advantages are particularly apparent on multi-engine installations, or those operating in cold climates.

The transmitting tube is obtainable in lengths to suit different installations.

Bristol Oil Centrifuger (Carter Patents).—This centrifuger is intended to be installed in the oil return from engine, and is supplementary to the standard engine filter, being intended

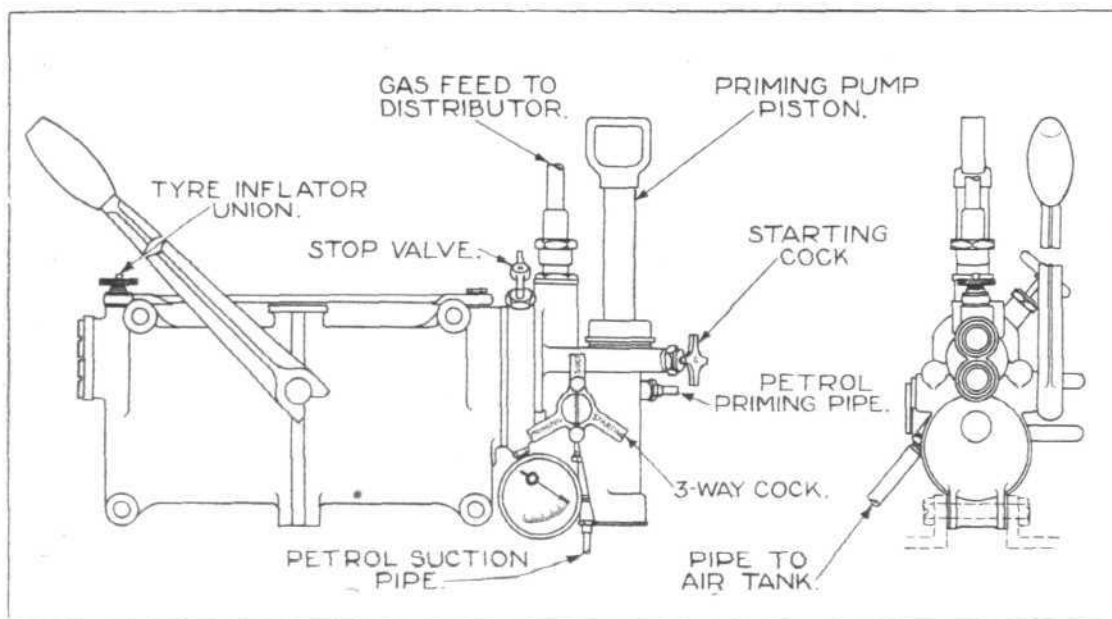


Diagram of Viet Starter.

sion must be made for cooling the lubricating oil after it leaves the engine.

The most suitable method is by means of an auxiliary oil cooler, which should be fitted between the scavenge pump and oil tank, care being taken that the position selected allows a good air flow through the cooler, both when climbing and flying level.

The size of the cooler will depend upon the operating conditions, but it must be sufficiently large to prevent the temperature of the oil feed to the engine exceeding 70° C., and the oil output from the engine exceeding 100 to 105° C. These figures, 100° to 105° C., are only permissible under exceptional circumstances, and 85° C. should be considered a maximum working figure. These allowable temperatures are for Castrol R, or pure-treated pharmaceutical castor oil.

To prevent damage to the oil system when starting up under very cold conditions, some form of bye-pass or short-circuiting arrangement must be included, automatically cutting out the oil cooler until the oil warms up.

The standard Bristol coolers are of the tubular type, and are made in three sizes:—The small, or 10-tube type, suitable for fast and lightly-loaded machines. The medium, or 12-tube type, suitable for medium-speed machines, and the large, or 11-tube annular type, suitable for heavily loaded, slow-speed machines, or those operating in tropical climates.

A spring-loaded bye-pass relief valve is incorporated in each type, safeguarding the cooler against damage from

to trap the extremely fine particles of foreign matter which the standard filters cannot cope with.

The centrifuger is operated by the oil circulation, and a bye-pass is incorporated, permitting the oil to discharge freely in case of the centrifuger being temporarily out of action.

STARTER SYSTEMS

On the ungeared "Jupiter" engines, provision is made for priming the induction system, to be used in conjunction with propeller swinging by means of a Hucks Starter, and a hand starter magneto connected to the centre terminal on the main magnetos. A suitable primer for general use is the Ki Gass, while for cold climates, a somewhat different arrangement is recommended.

On all engines, provision is made for using a pressure starter, such as the Bristol Gas Starter, or the hand-operated Viet Starter. For the latter, a special distributor valve is required. On the geared engines, a hand-turning gear is fitted.

The reduction ratio is 30 to 1, and provision is made for operating handles to be fitted to the port and starboard sides, and either or both can be used.

The hand turning gear should be used in conjunction with a suitable priming system and hand-starter magneto.

For details of the installation, equipment, etc., application should be made to the Bristol Company direct.

Metal Propellers as Skids

It will probably be remembered that when the late Mr. Larry Carter crashed on a racing aeroplane, the Fairey metal propeller bent under the fuselage, and formed a sort of skid, on which the machine slid along without overturning. At the time it was thought that this was something of a

"freak" occurrence. There have, however, more recently been several cases where the same sort of thing has happened, and always when the undercarriage has given way the Fairey metal propeller has doubled under the fuselage and formed a skid on which the machine slid along. Thus may a metal propeller definitely serve to save lives in a crash.

AIRISMS FROM THE FOUR WINDS.

African Service Flight

THE four R.A.F. Fairey IIIF machines (Napier "Lion" engines) engaged on the African service flight, arrived at Beaufort West, Cape Colony, on March 6. They reached their outward destination, Cape Town, on March 7. The flight started from Cairo on February 12.

Light Plane Flight to Baghdad

MRS. SPENCER CLEAVER left Croydon in a "Gipsy-Moth" on March 7 for Baghdad and Karachi, piloted by Capt. D. Drew of Imperial Airways, Ltd. She arrived at Le Bourget the same day and at Marseilles on March 9.

Business Magnate's Successful Tour

MR. VAN LEAR BLACK, the American millionaire, reached Cape Town safely on March 5 in his Fokker monoplane (fitted with three Wright "Whirlwind" engines). He started his flight from Croydon on February 11, and reached Le Bourget, Paris, the same day. He was next reported at Cairo on February 21, having flown from Athens. On February 25 he started off from Khartoum for Mongalla. The stage from Bulawayo to Pretoria was flown on March 1. Then came the arrival on March 5 at Cape Town. That flight is but an 8,000 miles section of the total of 35,000 miles which Mr. Van Lear Black has planned. He will presumably fly back to Cairo now, then cut across the air mail track through Arabia to Baghdad, Basra and Karachi, then over India to get on the usual air route to China. The tour is being carried out for business purposes, and he is accompanied by two pilots and his valet—his usual crew.

Light Plane Flight

MR. J. SCOTT TAGGART, a private owner, landed at Lausanne in his "Gipsy-Moth" after a solo flight from London. He is a member of the London Aeroplane Club and has offered to present the Club with a new "Gipsy-Moth" fitted with Handley-Page slots, if another is obtained by the efforts of the Club itself.

French Attempt at Record

THE French pilot, Pierre Lemoigne, attempted an altitude record recently. During a trial flight at Villacoublay he reached a height of about 35,720 ft. Three sealed barographs which he took up with him have yet to be examined by the authorities, but it is believed that he may have reached nearer 40,000 ft. than 35,000 ft. Flying a monoplane of 600 h.p., he remained in the air for an hour and a half. On landing he explained that he was confident that he could have gone still higher had it not been that his supply of oxygen was running short. His instruments showed that during one part of his flight he encountered a temperature of 55° C. below freezing point (67° below zero F.). Lemoigne is to renew his attempt on the world's record next week should he not already have broken it. The present altitude record is held by the American, Champini, with 37,997 ft.

Col. Lindbergh

THE recent flying activities of Col. C. Lindbergh included a flight from Mexico City to Brownsville, Texas, with mails and passengers. That was the inauguration of the service between the two cities. He made the return flight to Mexico City on March 11.

German Air Woman Plans Atlantic Flight

FRAULEIN THEA RASCHE, the German airwoman, is now in New York, and is reported to be planning an attempt upon the Atlantic by air.

Harmon Trophy Award

LIEUT. CARL EIELSON, the pilot who accompanied Sir Hubert Wilkins on the Arctic flight last year, has been awarded the Harmon Trophy for 1928. This trophy is given to the American airman making the greatest contribution to aviation during the year. Col. Lindbergh won the award in 1927.

Australian Business Tours

WRITING from Adelaide, S. Australia, Mr. C. R. Jaques, formerly a lieutenant, R.A.F., informs us of a tour he made in an Avro "Avian" ("Cirrus"), in the "outback" on behalf

of the Shell Company. In many of the places visited an aeroplane had not been seen before. He first covered 2,000 miles in seven days, and then 3,000 miles in ten days. The machine and engine required no attention except for the normal adjustments. The first tour takes the Shell representative six weeks to cover by car, and nearly eleven weeks for the second tour. There are only tracks to follow, roads not existing.

Air Links With Shipping

NEGOTIATIONS are in progress between German and French Governments for the institution of a Cherbourg-Berlin air mail service this summer to connect with the arrivals at Cherbourg of Transatlantic liners. The new service would reduce by three days the time taken in transit by American mail for Germany.

America's Ambitious Plans

NEW YORK proposes to have the largest airport in the world. It will be 743 acres in extent and within 15 mins. of New York. The New York Air Terminals Company have acquired this acreage in New Jersey, and in less than a year machines will be able to use it. The designs also provide for an artificial lake of 56 acres for seaplane flying.

Lifeboat For Aircraft

REAR-ADMIRAL T. P. H. BEAMISH, speaking at Dover on March 7, at a meeting organized by the Royal National Life-boat Institution, said that Dover was to be provided with the fastest lifeboat in the world. She had been designed to do 18 knots. She would be 64 ft. long and 14 ft. wide, and would be driven by twin screws, each driven by an engine of 375 h.p. The fastest boat now in existence had twin screws, each driven by an engine of 80 h.p. She would be fitted with wireless, and a wireless telephone would allow those on shore to communicate with the boat at all times.

Aerial Photography

ABOUT 250,000 aerial photographs of Canada have been assembled as a nucleus for the formation of an inventory of the Dominion's natural resources.

American "Genet" Engines

IT is reported that the Fairchild Airplane Manufacturing Co. of America, has acquired from the Armstrong-Siddeley Motors, Ltd., exclusive rights to manufacture and sell the "Genet" air-cooled radial engine in America. An output of at least 100 per month by July 1 is expected. It will be produced primarily in America for the Fairchild "21" two-seater low wing monoplane, designed for sport and training purposes.

Peshawar Bombing Enquiry

THE court-martial on Maj. M. C. Harrison, D.S.O., M.C., of the 1st Armoured Car Company of the Royal Tank Corps, following the Peshawar air bombing accident, in which 13 Indian troopers were killed and 12 wounded, has led to his acquittal on the first charge brought against him and reservation of judgment in the second charge. Maj. Harrison was accused of culpable neglect, to the prejudice of good order and military discipline. The accused officer said he was wholly unaware that the area in which the R.A.F. practice bombs were dropped on the cavalry had been wrongly described. He had no reason to suspect that there was any possibility of danger. The line laid down for the "enemy" during exercises was followed. Giving evidence at a previous hearing, Colonel A. G. Bayley, of the staff of the General Officer Commanding the Peshawar District, expressed the opinion that, provided a directing officer knew he was directing none of his men into a dangerous area, and also knew that no orders had been given to them to assemble in a danger area, and that safety precautions had been arranged, no blame could be attached to him.

Motor Speed Record

ON his Irving-Napier car *Golden Arrow*, Maj. H. O. D. Segrave set up a motor record of 231.36 m.p.h. on March 11, at Daytona Beach, Florida. The Napier "Lion" engine in his car (fitted with B.T.H. magnetos) enabled him to beat the previous record by nearly 24 m.p.h.

A GREAT UNDERTAKING

As makers of the widest and most successful range of British aircraft and engines the Armstrong Siddeley Development Co. Ltd. is in a unique position to offer the results of its extensive experience on matters relating to air transport, training, fighting or private flying machines on land or sea in any part of the world.

Brief details of aircraft and engines are given below. Full particulars and prices may be obtained on application.

AIRCRAFT

AIRCRAFT FOR THE SERVICES

The Armstrong Whitworth All-Steel Atlas 2-seater Fighter or reconnaissance machine, fitted with an Armstrong Siddeley Jaguar engine and either wheels or floats.

The Armstrong Whitworth All-Steel Siskin 3.A. single seater Fighter fitted with an Armstrong Siddeley Jaguar engine.

The All-Steel A.W.A. 14 high performance Fighter fitted with an Armstrong Siddeley Jaguar engine.

AIRCRAFT FOR CIVIL PURPOSES

The Armstrong Whitworth Argosy. A 20-seater Airliner fitted with three Armstrong Siddeley Jaguar engines.

The Avro Commercial Monoplanes. A 4-5 seater or 8-10 seater both fitted with three Armstrong Siddeley engines.

The Avro-Avian. A 2-seater light aeroplane fitted with Cirrus or Armstrong Siddeley Genet engine and either wheels or floats.

AIRCRAFT FOR SCHOOL & CLUB PURPOSES

The Avro Gosport, fitted with Armstrong Siddeley Mongoose engine and either wheels or floats.

The Avro 504.N. fitted with Armstrong Siddeley Lynx engine and either wheels or floats.

The Avro-Avian, fitted with Cirrus or Armstrong Siddeley Genet engine and either wheels or floats.

ENGINES

THE LEOPARD

The Armstrong Siddeley 700-750 h.p. 14-cylinder Leopard for civilian use or for carrying troops or torpedoes.

THE JAGUAR

The Armstrong Siddeley 460-500 h.p. 14-cylinder Geared Jaguar for Civil or Service requirements. Jaguar engines have been in service on the London-Paris Airway for over three years.

The Supercharged 14-cylinder Jaguar is specially designed for maintaining power at high altitude.

Note.—The Armstrong Siddeley Geared Centrifugal Supercharger was the first device of its kind supplied to the British Government and has now been in use for three years.

THE LYNX

The Armstrong Siddeley 230 h.p. 7-cylinder Lynx as used on the Amsterdam-Batavia, Munich-Milan and other airways.

THE MONGOOSE

The Armstrong Siddeley 130-140 h.p. 5-cylinder Mongoose engine for training work on land or sea.

THE GENET

The Armstrong Siddeley 80-88 h.p. 5-cylinder Genet, an engine which is very much lighter than any engine in its class and is, therefore, particularly suitable for powering light aircraft.

SIR W. G. ARMSTRONG WHITWORTH AIRCRAFT LIMITED.
Works & Aerodrome: Whitley, Coventry. London: 10 Old Bond Street, W.1

ARMSTRONG SIDDELEY MOTORS LIMITED.
Head Office & Works: Coventry. London: 10 Old Bond Street, W.1

A. V. ROE & COMPANY LIMITED,
Newton Heath, Manchester
and 166 Piccadilly,
London, W.1.

THE AVRO TEN

A Three Engined Commercial Monoplane

The Avro Ten is a British version of the Fokker F.VII-3m., built under licence from the Fokker Company (N. V. Nederlandsche Vliegtuigenfabriek).

It carries eight passengers and is fitted with three 230 h.p. air-cooled Armstrong Siddeley Lynx engines.

Monoplanes of this type have attained a world-wide reputation for reliability, ease of maintenance and economy of running—qualities that have been proved during a period of several years.

They are used by the principal Dutch, Swiss and Italian Airlines.

Leading Features

ENDURANCE. 4 or 6 hours according to fuel capacity at a cruising speed of 96 m.p.h. with normal full load.

CONTROL. Complete dual control with side-by-side seating for pilots. Tail trimming gear allows large variation in the position of the centre of gravity.

CABIN. Dimensions 10' x 5' x 6' with seats for eight passengers. Broad windows with wide angle views. Large door and direct access by fixed step.

BAGGAGE. Three compartments, total capacity 114 cubic feet.

FUSELAGE. Tubular steel with welded joints braced with steel struts and high tensile steel wire. Covered with fabric.

UNDERCARRIAGE. Special design of simple construction providing wide track. Rubber shock absorbers with special method of adjustment.

ENGINE MOUNTING. Of simple design permitting quick removal.

TANKS. Oil tanks fitted behind engines, fuel tanks fitted in wing providing simple gravity feed. Capacity with two tanks 150 gallons. With three tanks 225 gallons.

WING. Single unit of cantilever construction. Built of wood and covered with plywood to facilitate maintenance.

A. V. ROE & COMPANY, LIMITED
MANCHESTER

THE LYNX ENGINE

A 7 Cylinder Air-Cooled Radial

The 230 h.p. Armstrong Siddeley Lynx engine has attained a world-wide reputation for reliability and ease of maintenance.

It was with Lynx engines that Lieut. Koppen flew his Fokker F.VII-3m. from Amsterdam to Batavia and back, covering 18,000 miles in 18 days. It was with Lynx engines that Fokker machines repeated the Amsterdam-Batavia flight with equal reliability last summer, and it was with Lynx engines that the difficult Munich-Milan Italian Airline and two new Airlines in Switzerland were equipped.

Lynx engines are used in more than twenty different countries, where their independence of climatic conditions have been amply proved. They have been used with equal success in Central Africa and within the Arctic Circle.

Fitted on Avro Aircraft they are the standard training engine of the British Air Force and are widely used for seaplane training. They are also used for two-seater reconnaissance machines, single-seater fighter aircraft, deck-landing aircraft and twin-engined seaplanes.

Many of their principal parts are interchangeable with those of the Armstrong Siddeley 14-cylinder Jaguar and 5-cylinder Mongoose engines. Where different types are in service this effects great economy in the storage of spares and general maintenance.

Leading Features

7 cylinders, 5" bore \times 5.5" stroke.

Compression ratio 5 to 1.

Normal r.p.m. 1,900. Maximum r.p.m. 2,090.

Engine weight 513 lbs.

Direction of rotation, Left Hand Tractor.

ARMSTRONG SIDDELEY MOTORS LTD.
COVENTRY

A
REMARKABLE
PERFORMANCE

The Armstrong Siddeley Jaguar engines
used by Imperial Airways Limited on
the Argosies flying between London and
Paris have set up a period of 400 hours
between overhauls, the usual
top overhauls having
been discontinued
altogether.

This achievement is claimed as a record of
endurance, unsurpassed by any other engine
in the world.

ARMSTRONG SIDDELEY
MOTORS LIMITED
COVENTRY

PRIVATE FLYING

A Section of FLIGHT in the Interests of the Private Owner, Owner-Pilot, and Club Member

WITH AN AVRO "AVIAN" ("CIRRUS" MK. III) IN AMERICA

Capt. W. N. Lancaster's New Flight

CAPT. W. N. LANCASTER, the British pilot, who flew to Australia from England in 1927-28, with Mrs. Keith Miller as his passenger, in the Cirrus-Avian *Red Rose*, left New York on March 1 last on a light plane tour to South America and back. His machine is an



Capt. W. N. Lancaster, now engaged on the American tour described. He flew to Australia with Mrs. Keith Miller in 1927-28 in the Cirrus-Avian, "Red Rose."

Avro "Avian" (A.D.C. "Cirrus" III), and he is competing for a gold medal which is being offered for the first successful light aeroplane flight over the route from New York to the West Indies, Northern Coast of South America, Panama, Central America, Mexico and back to New York.

This medal is being awarded by the Central Union Trust Company of New York. Capt. Lancaster is a demonstration pilot for the American Cirrus Engines Inc., and that company instructed him to take part in the flight.

The entire distance is about 10,000 miles and is expected to take a month to complete. There will be several long sea stretches to cross, as our sketch map shows. From New York the stages run, Norfolk, Va.; Wilmington, N.C.; Jacksonville, Florida; Miami, Havana, Porto Rico, Guadeloupe; Martinique, Trinidad, Georgetown (British Guiana); Venezuela, Colombia, Panama, Mexico City, then round Texas to Miami and back again to New York.

Capt. Lancaster is flying solo. The American Cirrus Engines Inc. have acquired the rights to manufacture "Cirrus" engines in America, and have lately increased their working capital by the sum of one million dollars. They are proceeding rapidly with the manufacture and sale of the "Cirrus" engine in America.

The best light aeroplane built for a "Cirrus" Mk. III engine

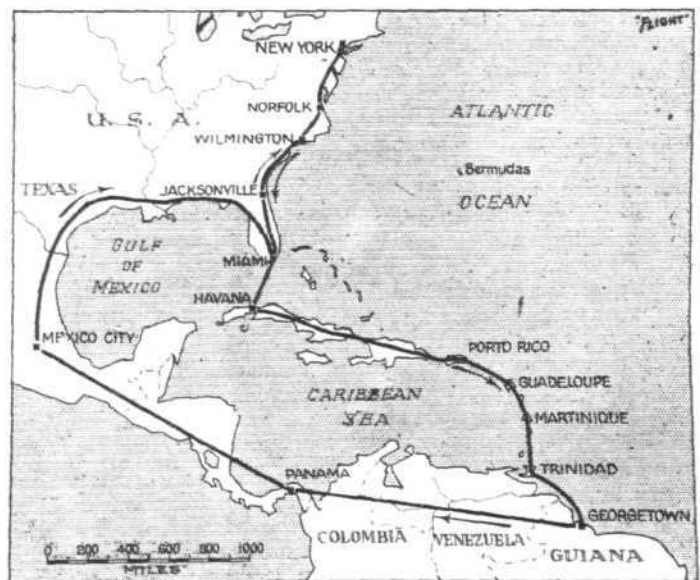
and submitted by August 15, next, will win a prize of \$500 offered by Col. R. Potter Campbell, according to the *Scientific American*. The judges will include Miss Amelia Earhart, who flew the Atlantic as a passenger in the seaplane *Friendship*, Mr. George Putnam and Professor Alexander Klemm.

Capt. Lancaster came into prominence with his flight to Australia, mentioned above. He came near to being the first pilot to fly by light plane to that Dominion, because he started some time before Sqdrn.-Ldr. Hinkler. An unfortunate crash at Muntok, in the Dutch East Indies, delayed him seriously, and in the meantime Hinkler made his spectacular dash and arrived first.

Capt. W. N. Lancaster was a member of the R.A.F. Reserve. He was educated at Stafford College and went to Australia in 1914. During the war he enlisted in the Australian Light Horse and was sent to the Middle East. In 1917 he served in France in a field company of Australian Royal Engineers, and then joined the R.A.F. He also served in France and England with the Australian Air Force, as well as the R.A.F. At the end of the war he was placed on the unemployed list and studied at the London University. In 1920 he returned to the active list and went to India. He is an amateur steeplechase rider, and he won the amateur broncho-riding competition at the Wembley Rodeo in 1924.

After his Australian flight he went to America and has been engaged in flying activities there since. Mrs. Lancaster, his wife, recently accompanied Lady Heath on the flight to Miami, described in a recent issue of FLIGHT.

With Lady Heath, Capt. Lancaster was recently the guest of the third year students at Yale at their annual "Proms." When they landed at Bethany Field, New Haven, Conn., they were met by a group of students—all in the prevailing fashion of Raccoon coats. The snowy flying field looked as if 300 had got loose on it. The machine in which they flew down from New York was also an Avian-Cirrus, the property of American Cirrus Motors Inc. They started back at 7.30 a.m. and were seen off by the students—still in evening dress!



Sketch map of the course being followed by Capt. W. N. Lancaster in an Avro "Avian" (A.D.C. "Cirrus" III). The distance is about 10,000 miles and is expected to take a month. A gold medal will be awarded the winning pilot by the Central Union Trust Co. of America.

AN AERODROME FOR CAMBRIDGE

Another Private Venture

WHEN the need for landing fields and aerodromes was raised a year or two ago, investigation showed that there were many farmers and landowners willing to allow aircraft to land on a part of their land, subject to the offer of compensation if damage should be done. Nearly all of these sportsmen did not want paying for their kindness apart from that, but at the same time, they were not, of course, prepared to lay out their land with facilities for aircraft, apart from landings.

Their assistance was generously offered in most cases because no one was attempting to serve the needs of airmen. They did not wish to enter aviation themselves for commercial purposes. They were willing stop-gaps.

In those not very distant days there was never any sign of commercial undertakings in aerodromes. No one thought that it might be profitable to acquire a plot of convenient land and equip it for the normal needs of visiting aircraft. Then the Air Ministry stepped in and urged upon the country the importance of municipal aerodromes. Its authority lent just that weight necessary for the public to take notice, and so we got a flood of municipal discussions, and it is now having excellent results.

It is almost difficult to keep track of all the towns which are planning sites, and it is safe to predict that during this year we shall be able to land on many municipal airports. By next year, anyhow, we may find at least a suitable field in the vicinity of every town of importance. And in a few years' time we shall, no doubt, judge the importance of a town by its possession of an aerodrome or not. At least, air pilots will.

Now the prominence of this national question of aerodromes has evoked a curious side issue. One had not been led to see any signs of promise except from municipalities. But we find today that private enterprise has looked in and is striding ahead of municipalities. There is a growing belief in many alert business minds that after all it might pay to establish a private aerodrome near a town. Within the last few months we have had three fine examples of this belief.

Three Private Aerodromes

First we have Airwork, Ltd., of Heston, Middlesex, favoured with no official subsidy, laying out private capital on a good site within ten miles of London with great confidence. Before this flying season definitely opens they will be prepared for the test of their enterprise. And it already looks as though Heston is going to prove a most popular aerodrome in London for private flying, meetings and training.

Secondly, we have the Reading aerodrome, almost ready, laid out by Messrs. Phillips and Powis (Aircraft), Ltd., a local company. We have already given particulars of it, and of Heston. Reading aerodrome will be opened after Easter; instruction on D.H. "Moths" beginning on April 2. There is already a good list of pupils waiting. But the new company will commence joy-riding operations on Easter Saturday, Sunday and Monday, with Le Rhone-Avro machines at the Caversham Bridge Promenade Field.

Now we are able to announce another new field instituted by private enterprise.

Lady Bailey Honoured

THE Geographical Section of the Forum Club gave a dinner in honour of the Hon. Lady Bailey on March 8. Mrs. Patrick Ness was the chairman.

Aviation in Manchester

THE Manchester Corporation has provided a temporary landing ground near Wythenshaw Park, so that air taxi work may start from the city in a month. In September, a transfer will be made to the permanent aerodrome at Chat Moss. The Air Ministry has agreed to Manchester spending £35,000 in equipping their Chat Moss site. The work will commence immediately.

Lady Heath's Company

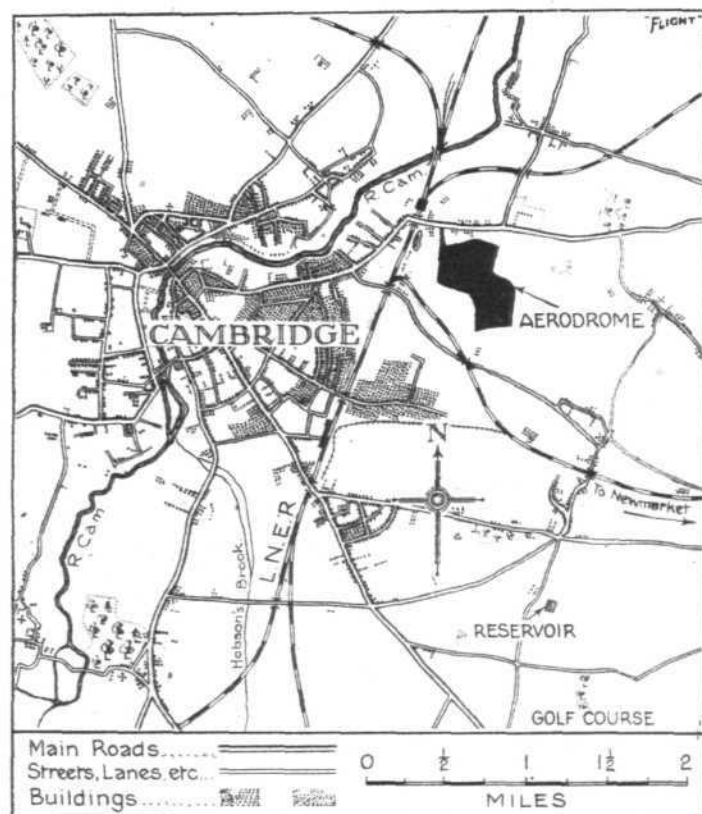
THE formation of a company to be known as "Aerial Activities" is announced in New York with Lady Heath as president. It is said that the company will handle all the aviation interests of Lady Heath.

Tees-side Aero Club

Now that there is a prospect of a municipal aerodrome at Middlesbrough, the Tees-side Aero Club, whose activities have been dormant during the past few months, chiefly due to a lack of public interest, has taken a new lease of life,

This is at Cambridge, and our accompanying sketch map gives its location. Marshalls, automobile engineers, of Jesus Lane, Cambridge, are opening it shortly. It appears from the description to be quite suitable. It is on the main Cambridge, Newmarket Road, and less than 2 miles from Cambridge. There is a railway station 200 yards away, and a 20-mins. bus service connection.

One hangar has already been erected, and the whole site, which is approximately 65 to 70 acres, is about to be put



A new Cambridge aerodrome which is being established by Marshalls, local Automobile Engineers, and will be ready in June. It covers about 70 acres and offers a take-off run in any direction of 500 yards.

down to grass. There will be a take-off run in any direction of 500 yards. The site should be completed by June next. Marshalls are agents for the De Havilland Aircraft Co., Ltd., and they already have their own demonstration machine ready at the aerodrome.

There is already one aerodrome in the Cambridge area, namely, the Conington aerodrome, which is used by the Cambridge branch of the Suffolk and Eastern Counties Aeroplane Club.

and a meeting is shortly to be held with a view to establishing a flying club.

Curious Accident to Club Member

WE learn from the Nottingham Aero Club of an accident to one of their members last Saturday afternoon; namely, Mr. A. J. Peacey, of Derby. After having 30 mins. dual with Mr. Brown, Mr. Peacey was told to go up and carry out landing practice for 20 mins, during which time he was not to leave the immediate vicinity of the aerodrome. He was observed to carry out two landings and then, at 11.40 hrs. he disappeared, nothing further being heard of the machine until 14 hrs. on Sunday, when a message was received from the Air Ministry to say that the D.H. "Moth" had been found by a German steamer 90 miles E.S.E. of Hull. The machine was wrecked and there was no trace of the pilot. Mr. Peacey was a flying officer on the Reserve of Air Force Officers, and had done just over 800 hrs. flying. The club extends its deepest sympathy to Mrs. Peacey and relatives.

Registered Aircraft

CIVIL aircraft registered in Great Britain and Northern Ireland number 453, of which 361 have been granted certificates of air-worthiness.

LIGHT 'PLANE CLUBS

London Aero Club, Stag Lane, Edgware. Sec., H. E. Perrin, 3, Clifford Street, London, W. 1.

Bristol and Wessex Aero Club, Filton, Gloucester. Secretary, Major G. S. Cooper, Filton Aerodrome, Patchway.

Cinque Ports Flying Club, Lympne, Hythe. Hon. Secretary, R. Dallas Brett, 114, High Street, Hythe Kent.

Hampshire Aero Club, Hamble, Southampton. Secretary, H. J. Harrington, Hamble, Southampton.

Lancashire Aero Club, Woodford, Lancs. Secretary, Mr. Atherton, Avro Aerodrome, Woodford.

Liverpool and District Aero Club, Hooton, Cheshire. Hon. Secretary, Capt. Ellis, Hooton Aerodrome.

Midland Aero Club, Castle Bromwich, Birmingham. Secretary, Maj. Gilbert Dennison, 22, Villa Road, Handsworth, Birmingham.

Newcastle-on-Tyne Aero Club, Cramlington, Northumberland. Secretary, J. T. Dodds, Cramlington Aerodrome, Northumberland.

Norfolk and Norwich Aero Club, Mousehold, Norwich. Secretary, G. McEwen, The Aerodrome, Mousehold, Norwich.

Nottingham Aero Club, Hucknall, Nottingham. Hon. Secretary, Cecil R. Sands, A.C.A., 30, Park Row, Nottingham.

The Scottish Flying Club, 101, St. Vincent Street, Glasgow. Secretary, George Baldwin, Moorpark Aerodrome, Renfrew.

Southern Aero Club, Shoreham, Sussex. Secretary, Miss N. B. Birkett, Shoreham Aerodrome, Sussex.

Suffolk Aero Club, Ipswich. Secretary, Maj. P. L. Holmes, The Aerodrome, Hadleigh, Suffolk.

Yorkshire Aero Club, Sherburn-in-Elmet, Yorks. Secretary, Lieut.-Col. Walker, The Aerodrome, Sherburn-in-Elmet.

LONDON AEROPLANE CLUB

(MAR. 4-10).—Pilot instructors: Capt. V. H. Baker, M.C., A.F.C., and Capt. F. R. Matthews. Ground engineers: C. Humphreys and A. E. Mitchell. Aircraft: The following machines were in commission—G-AABL, G-EBXS, G-EBZC. Total flying time: 51 hrs. Dual instruction: 36 members received dual instruction, the time being 24 hrs. 55 mins. Solo flying: 25 members flew solo during the week, the time being 26 hrs. 5 mins.

During the week E. L. Gosling and N. F. Shelley made their first solo flights.

Clubhouse Fund.—The committee desire to acknowledge, with thanks, the following further donations towards the Clubhouse Fund: J. A. Brewster, £1 1s.; Mrs. Brewster, £1 1s.; and C. J. Pool, 10s. 6d.

BRISTOL & WESSEX AEROPLANE CLUB, LTD.

(MAR. 3-9).—Pilot instructor: E. B. W. Bartlett. Ground engineer: A. W. Webb. Machines in commission: (2), T.V. ST. Flying time for the week: 19 hrs. 45 mins. Pupils under instruction: (6), 7 hrs. 20 mins. Soloists under instruction: (2), 20 mins. "A" pilots flying: (5), 7 hrs. 35 mins. Passengers carried: (10), 5 hrs. 20 mins. Test flights: (6), 40 mins.

Magneto disease shows no sign of abatement, and we now have five of our six magnetos in the hands of the makers. The makers have lent us a spare, but we have only had one machine in commission throughout the week in consequence of what would appear to be an unparalleled sequence of failures, an explanation of which is eagerly awaited. Mr. Downes-Shaw very generously lent ST for use as a club machine on Saturday. We take this opportunity of wishing him the best of luck in ST for his trip to Algiers, which he intends to commence next Friday. We hope to send details of this flight on his return. Mr. Davis successfully negotiated his first solo this week. The improvement in the weather has had the immediate effect of a welcome increase in pilot members. A committee is now busily engaged in drawing up a programme of attractions for the season—flying, social, and both these combined. Amongst other functions we are expecting to arrange a number of visits by four or five Club and members' machines to suitable centres round Bristol, where members living in the district will beat up their friends and organise a propaganda meeting.

CINQUE PORTS FLYING CLUB

(MAR. 3-9).—Pilot instructor: Maj. H. G. Travers, D.S.C. Ground engineer: Mr. R. H. Wynne. Machines: R1 and NN. Total time for week: 19 hrs. 30 mins. Dual: Mr. Shaw-Kennedy, 2 hrs. 15 mins. Capt. Took, 15 mins.; Mr. R. Dallas Brett, 15 mins.; Mr. Hunt, 15 mins.; Mr. Crammond, 15 mins.; Mr. Story, 15 mins.; Mr. Evernden, 5 mins.; Mr. Somerset, 15 mins.; Mrs. Travers, 2 hrs. 40 mins.; Mr. Nicholson, 2 hrs. 30 mins.; Mr. West, 35 mins. Total, 11 members, 9 hrs. 35 mins. Soloists under instruction: Mr. Nicholson, 3 hrs. 15 mins. "A" pilots.—Mr. R. Dallas Brett, 25 mins.; Mr. Crammond, 15 mins.; Mr. Story, 1 hr. 55 mins.; Mr. Douglas, 1 hr. 30 mins.; Mr. Somerset, 15 mins. Total: 5 members, 4 hrs. 20 mins. Tests: (12), 1 hr. 15 mins. Joy rides: (2), 20 mins. Special flights for photographic purposes: (2), 30 mins.

Mr. Nicholson, a new member from London who is an ex-R.A.F. pilot, but who had not flown for 11 years, and who had never, of course, flown a Moth, joined the club during the week and commenced instruction on Wednesday. After 2 hrs. 15 mins. dual he went solo on Friday 8th, and on the following day passed his flying tests for "A" licence in excellent style. The club congratulates him on a very good performance.

One of our members, Mr. H. R. Law, arrived in his Moth "YJ" on Saturday, and everyone was glad to see him back after his trip to America.

On Saturday, two special flights were made to enable Mr. May of Messrs. Halksworth Wheeler's Studio, Folkestone, to take some photographs from the air, and Mr. Crammond was also up trying out a Cine-Kodak.

After much deliberation the directors and committee have decided that for the club's next financial year, commencing on April 1, heavy cuts shall be made in entrance fee and subscription rates. This has been decided upon in view of the committee's faith in the fact that 1929 will be the long-awaited boom year in private aviation, and the club hopes to obtain in this way adequate support from Folkestone during the coming year, which support has been singularly lacking up to the present time. The new rates will be as follow:—

Full flying members.—Entrance fee, £1 1s.; annual subscription, £3 3s.

Ground members.—Entrance fee, £1 1s.; annual subscription, £2 2s.

Monthly flying members.—No entrance fee; subscription for 28 days, £1 1s.

Private owner members.—No entrance fee; annual subscription £1 1s.

No alteration has been made in the previous terms under special arrangement for members of the Household Brigade Flying Club, or officers taking the course at the Small Arms School, Hythe.

Rates for instruction and solo flying remain at £2 and 30s. per hour as formerly.

In addition, if a member qualifies for his "A" licence and the club receives the full subsidy from the Government in respect of it, the club will allow the member £6 worth of free solo flying on club aircraft as from April 1 next following the date on which he was granted his "A" licence, provided that the member is still a member of the club.

The above rates probably constitute the lowest scale of flight tuition ever offered to the public, and in practice a pupil of ordinary ability should be able to take his "A" licence for about £20.

HAMPSHIRE AEROPLANE CLUB

(MAR. 3-9).—Pilot instructors: Flight-Lieut. F. A. Swoffer, M.B.E., and Mr. W. H. Dudley. Ground engineers: Mr. E. Lenny and Mr. J. Elliott. Aircraft: D.H. 60 "Moth," G-EBOH and Avro "Avian" G-EBV1. Flying

time for the week: 45 hrs. 40 mins. Pupils under instruction: (22), 20 hrs. Soloists: (7), 11 hrs. 40 mins. "A" pilots: (13), 11 hrs. 40 mins. Passengers: (5), 1 hr. 45 mins. Tests: (7), 35 mins.

The recent improvement in the weather has led to a satisfactory increase in our flying times. Messrs. Harrison, Lusk and Villiers have all passed their tests for their "A" licences.

LANCASHIRE AERO CLUB

(MAR. 3-9).—Flying time 12 hrs. 10 mins. Instruction: (8), 2 hrs. 25 mins. Solo flights (14): 6 hrs. 35 mins. Passenger: (7), 1 hr. 20 mins. Tests: (11), 1 hr. 50 mins.

Instruction (with Mr. Hall): Hardy, Whitehouse, Cohen, Kay, Williamson, Stern, Maxwell, Sellers. Machines in commission: MQ, EC.

Soloists (under instruction): Whitehouse, Sellers, Williamson.

Pilots: Hall, R. F., Mills, Hardy, Lacayo, Twemlow, Meads, Weale, Nelson, D. Cohen, Harrison.

Passengers: (with Mr. Hall, R. F.), Miss Tunning, Davies, D. B.; (with Mr. Lacayo), Miss Cuedlar; (with Mr. Meads), Suddall, Allen, Woods; (with Mr. Hall), Sullivan.

We are reduced to two machines at the moment owing to the fact that QL has a damaged spar in the fuselage and XD has parted with her undercarriage. The operator in the latter case was Mr. Whitehouse, but he cannot claim all the credit for it as a patch of rough ground assisted him considerably.

Flying hours have suffered badly in consequence. Although perfect weather prevailed at the week-end and MQ our old Mark I "Cirrus Moth" was available all the time, she was very little used. There seems to be a tendency for pilots of the club to turn their noses up at MQ nowadays, which is a pity. Admittedly she is a bit slow on the climb, but having once got her height she is capable of gambling with the best of them.

Mr. Williamson completed his first and second solos during the week in excellent style. Mr. Sellers has been busy with his "A" licence tests, and Mr. Maxwell has commenced dual instruction and is shaping very well.

LIVERPOOL & DISTRICT AERO CLUB

(MAR. 3-9).—Instructor: Flight-Lieut. J. B. Allen. Ground engineer: Mr. H. Pixton. Machines: Avro "Avians," WK, XY. Flying hours: 23 hrs. Pupils: (17), 15 hrs. 25 mins. Soloists: (4), 1 hr. 15 mins. "A" pilots: (17), 5 hrs. 25 mins. Passenger flights: (3), 15 mins. Test flights: (8), 40 mins. New pupils under instruction: Mr. F. L. D. Salter, Capt. R. L. Lowndes.

Excellent flying weather has prevailed throughout the week. Spring is in the air, and our mysterious "Moth" mechanic has celebrated by working in a check suit and a bowler.

Congratulations to Messrs. Taylor and Waller, who both put up excellent first solo performances this week. Mr. Waller's effort is particularly worthy of note, as he took his favourite umbrella. Ustace, with him, after only 19 hrs. dual, this *sang froid* is just another instance of the efficiency and safety of learning to fly with the Liverpool and District Aero Club.

The Bristol and Wessex Club may find that their mis-firing trouble is due to rich mixture, and not magnetos. We had similar trouble a few weeks ago, which Mr. Pixton cured by cutting down the jets, again proving beyond dispute the great efficiency of the Liverpool and District Aero Club's staff.

WK (Mk. III "Avian," Mk. II "Cirrus") has recently completed 100 hrs. on Pratt's No. 3 petrol. The engine, on being stripped, showed no bad effects; starting and general performance were normal throughout the 100 hrs. In view of the "petrol ramp" this experiment may be of interest to other clubs. The Liverpool and District Aero Club are always pleased to help by passing on little tips of this nature. Bouquets and cigars to Mr. Pixton, please.

Mr. Moulds has learned several new tricks, some aerial, and one for use in the bar. The latter is a great success, and only demonstrates once again the splendid moral and *esprit de corps* of the Liverpool and District—Oh qui t

MIDLAND AERO CLUB

(MAR. 3-9).—Instructors: Flight-Lieut. T. Rose, D.F.C., and Mr. W. H. Sutcliffe. Engineer: W. J. Halland. Asst. engineer: G. Rees. Aircraft in commission: Three (LT, LW, DB).

The following members were given dual instruction: J. Cobb, R. L. Brinton, H. J. Barnett, A. E. Colman, G. Norton, H. C. M. Shaw, Maj. D. Thomson, K. Morton, Mrs. Leigh-Fermor, F. D. Scott, J. H. Stevens, J. N. Fisher, C. T. Davis, G. P. Haylock, J. B. Briggs, L. Lee, J. Ridsdale, M. C. Wilks, L. V. Mann.

Soloists: J. Cobb, R. L. Brinton, H. J. Willis, R. C. Baxter, R. L. Jackson, J. Rowley, M. Murtagh, E. D. Wynn, J. K. Morton, F. D. Scott, Maj. D. Thomson, H. C. M. Shaw, S. Duckitt, G. W. Perry, J. H. Stevens, A. E. Colman, C. T. Davis, W. L. Handley, F. J. Steward, L. Lee, W. M. Morris, R. D. Bednell, M. Blakeway, C. Fellows, M. C. Wilks, E. R. King, W. Swann.

Passengers: J. Haylock, Mrs. Thomson, Miss R. Toppin, L. Mann, A. Methley, W. Breedon.

G-EBXT has been undergoing its annual overhaul for renewal of C. of A. this week.

Maj. D. Thomson and Messrs. H. Hanford Stevens and C. T. Davis made successful first solos.

Mr. H. C. M. Shaw completed all flying tests for his "A" licence on Saturday

NEWCASTLE-UPON-TYNE AERO CLUB

(MAR. 4-10).—Instructor: G. M. S. Kemp. Ground engineer: K. C. Brown. Asst.: J. Tait. Aircraft: Three, PT, QV, LX. Flying time for week: 30 hrs. 30 mins. Instruction: (14), 12 hrs. 5 mins. "A" pilots: (15), 15 hrs. 15 mins. Solo training: (3), 1 hr. 30 mins. Passengers: (9), 1 hr. 35 mins. Test: (1), 5 mins.

Fine weather has enabled the club to again record an increase in flying time

and we hope it will continue. Miss Vendall successfully negotiated her first solo flight this week and put up a very good show.

Mr. Runciman, on his "Moth," VI, visited Turnhouse this week and returned yesterday in time to compete in the landing competition. Mr. N. S. Tod, the chairman of the club, obtained the highest number of points, and the final heat will be flown next Sunday. We congratulate Mr. J. D. Irving on obtaining his "B" licence, and expect him back shortly after completing his trip to Berlin via Paris on his "Moth," ADA.

NORFOLK & NORWICH AERO CLUB

(MAR. 4-10).—Instructor: J. C. Houston, M.C. Engineer: A. Kirkby. Total flying time: 28 hrs. 45 mins. Dual: 8 hrs. 15 mins. Solo training: 15 mins. "A" pilots: 15 hrs. 40 mins. Tests: 55 mins. Passengers: 3 hrs. 40 mins.

Five new members have joined the club during the week, including two flying members who have commenced instruction. Next week XE is due for a complete engine overhaul, so we shall have only two machines in commission. QX falls due the following week. It will be quite useful to get this job finished before the heavy flying commences.

A dinner and dance held in the club house last Thursday was an immense success, and we were fortunate in having the Radio Dance Band from Lowestoft, who kindly offered their services gratis. We are extremely grateful.

On Sunday afternoon we were pleased to have with us two of our private owners, Messrs. D. Corsellis and A. G. Marshall, who came over in "Gipsy-Moths" recently acquired by them. Mr. Corsellis flew over from Stag Lane and Mr. Marshall from Cambridge.

NOTTINGHAM AERO CLUB

(MAR. 3-8).—Pilot instructor: K. K. Brown. Ground engineer: F. H. Harley. Aircraft: D.H. 60X, G-AABA. Total flying time: 10 hrs. 35 mins. Dual: 2 hrs. 15 mins. Tests: 1 hr. 15 mins. Passenger flights: 35 mins. "A" licence pilots, solo: 4 hrs. "B" licence pilots, solo, 25 mins. Soloists under instruction: 2 hrs. 5 mins.

Flying time has again been curtailed owing to foggy weather. Mr. L. W. Hall has passed the tests for his "B" licence.

SOUTHERN AERO CLUB

(MAR. 4-10).—Perfect weather at the week-end brought to a close a busy week, and our flying times have taken an upward leap. G-EYB was scarcely on the ground on Saturday and Sunday.

Messrs. Sale and Barnett have now acquired their own dual Avro, 504K (110 Le Rhone), G-AAED, rebuilt at the aerodrome by the Southern Aircraft, Ltd., and are putting in much flying time on her.

Mr. A. Hart, one of the personnel of the R.A.F. Far East Flight, is a member, and visits us regularly.

SUFFOLK & EASTERN COUNTIES AEROPLANE CLUB

(MAR. 3-9).—Instructor: G. E. Lowdell, A.F.M. Ground engineer: E. Mayhew. Machines: Three Blackburn "Bluebirds," RE, SZ, and UH. Flying time for week: 12 hrs. 10 mins. —

Suffolk Aero Club.—Flying time: 9 hrs. 25 mins. Dual: (7), 3 hrs. 20 mins. Solo (under instruction): (4), 2 hrs. 35 mins. "A" licence: (4), 2 hrs. 50 mins. Passenger: (1), 5 mins. Tests: (6), 35 mins.

Mr. Ripley put up a creditable first solo, and Mr. Murray Payn passed his tests for "A" licence. Otherwise there was nothing to report, except the fact that we lost a day's flying as our instructor had to go for his medical examination for renewal of licence.

Cambridge Aero Club.—Flying time: 2 hrs. 45 mins. Dual: (2), 35 mins. "A" licence: (1), 35 mins. Passengers: (2), 1 hr. 35 mins.

According to present plans it is expected to open the Cambridge Club on a permanent footing on April 1, and the Air Display on Easter Monday is being held as an opening event. Mr. Hardesty, an instructor in pre-war days at the Ruffy Baumann School of Flying at Hendon, and a little later the founder of the Cambridge School of Flying, has been elected a member of the executive committee of the Suffolk and Eastern Counties Aeroplane Club, to represent the Cambridge Club, pending an important reorganisation scheme which is now being worked out. Much will be heard of the Cambridge Aero Club when certain negotiations, now progressing favourably, have been brought to a conclusion. There will be four competitive events open to all comers on Easter Monday, as follows:—(1) The "On-to-Cambridge" Rally; (2) Aerial golf; (3) Getting Away competition; and (4) Landing competition. First, second and third prizes are offered in each event. These competitions have been arranged to appeal to the private owner and club member of normal abilities, rather than to encourage the expert professional pilot who is already catered for by so many races at most meetings. We hope that our attempt to create a friendly afternoon's sport for this class of pilot will help to foster

friendship among the ever-growing number of amateur pilots. All interested in these competitions should apply for entry form to the Secretary, Hadleigh Aerodrome. It is hoped to arrange suitable hospitality in Cambridge on Monday night, with shed accommodation for machines, and we hope that all our old and many new friends will come along to Conington from the Lympe meeting to finish their Easter holidays with us.

YORKSHIRE AEROPLANE CLUB

(MAR. 3-9).—Pilot instructor: Flight-Lieut. H. V. Worrall. Ground engineer: R. Morris. Machines in commission: 2 (RF and SV). Flying time: 15 hrs. 50 mins. Instruction: (7), 3 hrs. 40 mins. Soloists: (2), 2 hrs. 40 mins. "A" pilots: (8), 9 hrs. 10 mins. Passengers: (2), 15 mins. Test flights: (1), 5 mins.

Fog and mist interfered with flying on several days in the week.

Mr. Anning successfully carried out his "A" licence tests on Wednesday, March 6. On Friday, March 8, we had a visit from Miss Spooner on her way back to town carrying as passenger, Mr. N. S. Norway, one of our directors.

FROM THE FLYING SCHOOLS

Brooklands School of Flying, Brooklands Aerodrome

(MAR. 4-10).—Managing director: Capt. H. D. Davis, A.F.C. Instructors for the week: Capt. E. A. Jones, Maj. C. M. Pickthorn, M.C., Capt. H. D. Davis, A.F.C., J. Oliver. Machines in commission: Avro G-EBVE, G-EBWJ and "Moths" G-EBMV, G-AAAG. Flying time: 43 hrs.

We have been extraordinarily fortunate, having had a nearly perfect week of weather apart from slight ground mists in the morning. It is certain that aviation is becoming rapidly more popular as can be judged from the fact that on Saturday alone six new pupils came to the school and commenced their training; in practically all their cases it was purely a matter of enthusiasm. Their names are Messrs. Mainwaring, Borkowski, Martin, Ogus, Ross, Crook. We also welcome the return of Miss Stoop and Mr. Whitard, who started flying last year but had to give it up for a few months. Sir Philip Richardson is progressing very rapidly and we do not think that he will take any longer to get his licence than the younger members of our community.

Henderson Flying School, Croydon Aerodrome

(FEB. 25-MAR. 10).—Two very busy weeks assisting "B" licence pupils to complete their tests have just passed.

Lieut.-Col. Henderson has just perfected an apparatus for "refuelling" the "Indian Gentleman" in the air—his duration powers not being equal to that of the "Moth." His hours are fast piling up—and he should have several days to spare. A number of new pupils have joined the school.

Mr. Loel Guinness is away in Cannes with VK, UZ being therefore very hard-worked—the teacher also.

Prospective pupils for "B" licences are turning the hair of all concerned greyer and greyer as the time for completion shortens, but all hope to complete in good time.

Merriam's Bureau have taken over the Mono-Avro for the time being, this machine being kept by them in their shed at Brooklands.

North Sea Aerial and General Transport, Ltd., Brough Flying School

(MAR. 4-10).—The fine weather of last week is reflected in our flying time which totals 31 hrs. 45 mins. Of this, "Kangaroos" accounted for 29 hrs. 40 mins., Flying-Officers McConnell, Lamb, Craigen, Hall and James receiving 2 hrs. 45 mins. dual and carrying out 26 hrs. 35 mins. solo flying. The remaining 20 mins. was occupied in test flights by Mr. A. G. Loton and Mr. J. B. Stockbridge.

Messrs. J. Riddell and H. W. Hall received 1 hr. 10 mins. dual on "Bluebirds," and tests by Mr. Loton and Mr. Stockbridge accounted for a further 55 mins. Although the weather has been fine every day, there has been a thick mist every morning, which has lasted until midday and prevented us from getting in as much flying as the weather conditions would seem to have made possible.

Surrey Flying Services School of Flying, Croydon Aerodrome

(FEB. 25-MAR. 10).—Secretary: R. D. Price. Instructor: J. J. Flynn. Ground engineers: R. Fox and F. A. Lacroix. Aircraft: Two (IV and VA). Flying time: 11 hrs. Soloists: 2 hrs. 30 mins. Passengers carried: 130.

Not much has been done by the school during the last fortnight owing to the weather. On Saturday, March 5, IV was slightly damaged by one of the pupils, but will be in commission again fairly soon. A new Avro is ready to fill the gap made by IV's crash, and will be in service within the next one or two days. Three new pupils have joined the school during the last week: Miss White, Mr. Blatt and Mr. Sorensen.

"The Helicogyre"

ON Monday, March 18, M. V. Isacco will lecture before the Royal Aeronautical Society on the "Helicogyre." The lecture will be delivered as usual in the Lecture Hall of the Royal Society of Arts, 18, John Street, Adelphi, W.C.2, at 6.30 p.m.—and, readers should note, *not* on the usual Thursday. In the course of his lecture, M. V. Isacco will briefly survey the various forms of helicopters which have been tried, and will then give a description of the "Helicogyre." In his lecture, M. Isacco will give a comparison between the "Helicogyre" and the fixed-winged aeroplane. There will also be a short description of the three machines built, and of the practical results already obtained. The lecture will be very fully illustrated, not only with slides and diagrams, but with cinematograph films showing the principle of the rotating wings with their engines.

Bristol Branch of R.Ae. Society

THERE was a large attendance at the first general meeting of the newly-formed Bristol branch of the Royal Aeronautical Society, held at the Merchant Venturers' Technical College. Professor A. J. Sutton Pippard, chairman of the branch, presided, and was supported by Air Vice-Marshal Sir Sefton Brancker, Director of Civil Aviation and an ex-president of the society, Capt. F. S. Barnwell (Bristol Aeroplane Co.), Mr. H. Bolas (George Parnall and Co.), Mr. C. W. Tinson (hon. secretary), Mr. E. B. W. Bartlett (Bristol and Wessex Aeroplane Club), Mr. R. Fedden, and others.

Sir Sefton Brancker said the system of local branches was a movement in which he took a deep interest, for they were really the life-blood of the whole thing. It was particularly fitting that Bristol should have a branch, because it was one of the pioneer cities of aviation. He remembered the old British and Colonial Co., and the fact that he had his first flight on a Bristol-made machine. That was in India in 1910, and a few days later he had his first crash. The society was the oldest aeronautical organisation in the world, having been formed in 1866. Like all old institutions, it got crusty and highbrow, and, in consequence, the younger men formed the Institution of Aeronautical Engineers. Their objects were the same, and eventually negotiations brought the two bodies together. Since the amalgamation the success had been great—membership going up and lectures and attendances improving. It was the only institution actually supported by the Air Ministry because of its great value to the nation. Bristol was the seventh branch, and each received as much assistance from headquarters as possible. Informal discussions had been found to be very successful, and in every way the Council were anxious to help the branches.

Capt. F. S. Barnwell, chief designer to the Bristol Aeroplane Co., Ltd., read a paper on American aircraft, and gave some interesting anecdotes of his recent tour of aviation centres in the U.S.A. He made some interesting comparisons between British and American aircraft, and also criticised from an expert's point of view.

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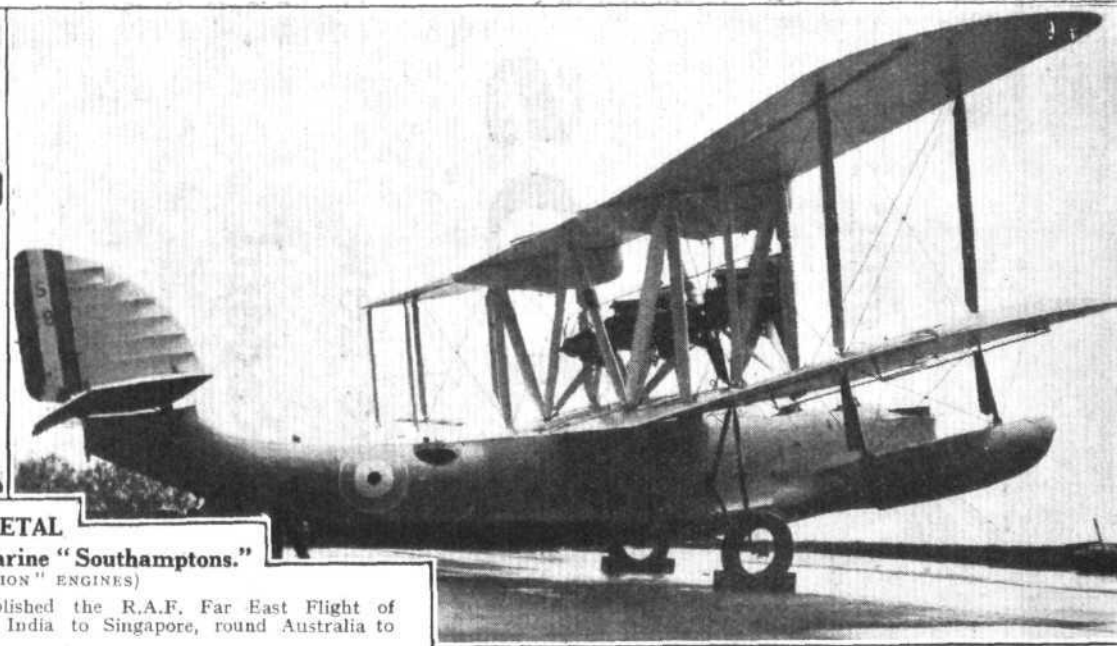
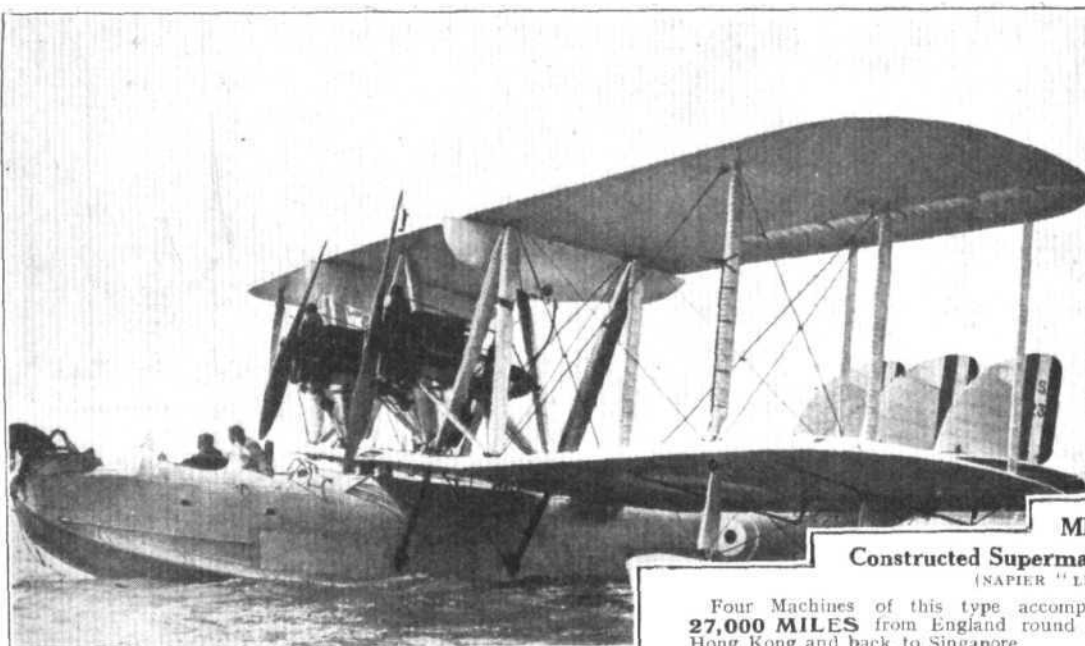
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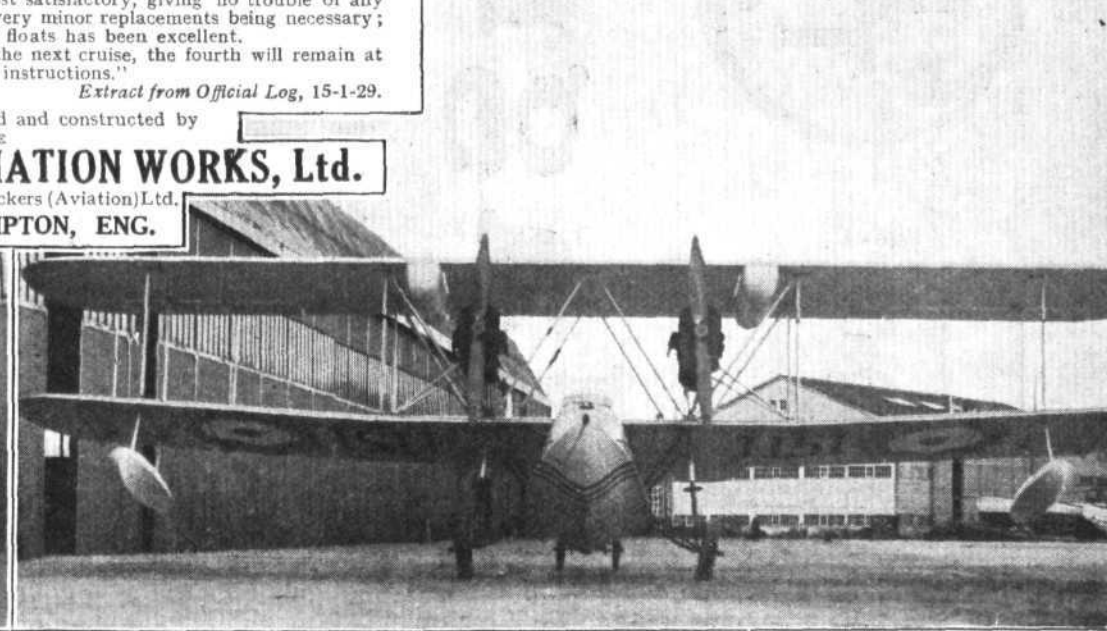
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The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

ASSOCIATED CLUBS GENERAL COUNCIL

REPORT of Meeting of the General Council held on March 1, 1929, at the Royal Aero Club.

Present: Col. Sir Joseph Reed (Newcastle-upon-Tyne Aero Club), in the Chair. *Royal Aero Club:* Lieut.-Col. M. O'Gorman, C.B.; Lieut.-Col. M. O. Darby, O.B.E.; Colonel The Master of Sempill, A.F.C. *Bristol and Wessex Aeroplane Club:* Colonel D. C. Robinson; Major G. S. Cooper. *Felixstowe Light Aeroplane Club:* Flight-Lieut. N. Comper. *Hampshire Aeroplane Club:* O. E. Simmonds; H. J. Harrington. *Lancashire Aero Club:* Maj. A. Goodfellow. *London Aeroplane Club:* The Hon. Lady M. Bailey; Maj. K. M. Beaumont; Capt. A. G. Lamplugh. *Midland Aero Club:* Maj. Gilbert Dennison. *Newcastle-upon-Tyne Aero Club:* Col. Sir Joseph Reed; Maj. B. M. Dodds. *Norfolk and Norwich Aero Club:* F. Gough; G. F. Surtees. *Royal Aircraft Establishment Aero Club:* P. N. G. Peters. *Suffolk and Eastern Counties:* Dr. James C. Sleigh; G. G. Gault. *Yorkshire Aeroplane Club:* Lieut.-Col. John Walker. *In attendance:* Harold E. Perrin, Secretary.

Air Estimates.—It was decided to address a letter (copy attached) to all Members of Parliament, pointing out that the object of the present grants to the light aeroplane clubs was to promote public interest in flying and to encourage people who could not at present afford to pay the full cost, to take up and practise flying at reduced rates, and asking for their interest and support in favour of the grants being extended for a period of five years at the expiration of the present agreements.

Official Meetings, 1929.—In view of the fact that the Royal Air Force could only promise support to Meetings held prior to June 15, 1929, it was decided to hold one official meeting only this year. This meeting was allotted to the Newcastle-upon-Tyne Aero Club, and will be held at Cramlington, Newcastle-upon-Tyne, in June. The General Council are arranging with the Air Council for the Royal Air Force to be well represented at this meeting.

Vice-President.—Colonel Sir Joseph Reed was unanimously re-elected Vice-Chairman of the General Council.

(Enclosure)

Air Estimates

SIR,—Your attention will, no doubt, have been drawn to the proposed formation of a company to be known as National Flying Services, Ltd., which has been promised a Government grant for the first ten years of its existence. One of the main objects of this company is to establish flying clubs all over the country and it is in respect of this work that a Government subsidy is to be paid. You will also be aware that there are at present in existence numerous Light Aeroplane Clubs formed at various times during the past five years with the approval and support of the Government. These Light Aeroplane Clubs are at the moment also in receipt of a grant, but in every case their agreements with the Government will expire within the next two years. It is apparently the intention of the Government that at the expiration of these agreements no further assistance shall be given to these clubs.

The following facts are submitted for your consideration:—

- (1) The existing clubs are at present efficiently run largely by the voluntary and unpaid work of flying enthusiasts. The excellence of their work, which has produced many hundreds of new pilots, and their value to the country have been acknowledged and commented upon by the Secretary of State for Air, the Director of Civil Aviation and other Public Authorities on many occasions both in the House and out of it.
- (2) Wherever the demand and enthusiasm have justified it, such clubs have come into existence. They are coping adequately with all present requirements and, given a reasonable degree of support and encouragement, are fully capable of expanding to cope with any increased demand.
- (3) Co-operation exists between the light aeroplane clubs through the medium of the General Council, on which all the above clubs have representation. At the same time a healthy local rivalry exists between the respective clubs which tends towards progress and efficiency.
- (4) If the training and practice of civilian pilots be taken over entirely (or even nearly so) by a large commercial company, a quasi-monopoly will be produced, which will be adverse to the best interests of flying. Moreover, the proposed new company must be looked upon as experimental in its nature and its commercial success cannot be considered as assured for a considerable time to come. If after squeezing out or absorbing the existing clubs, it should itself fail, the result would be extremely unfortunate for aviation generally in this country.
- (5) It is submitted that if Government assistance in any form is to be granted to the new company it should take the form rather of a small maintenance grant towards the cost of the new aerodromes and landing grounds which the company has undertaken to provide and which will be of real benefit and advantage to flying in the country. At the same time steps should be taken to ensure the continuance of the existing light aeroplane clubs at any rate until such time as the success of the new venture is established.
- (6) The object of the present grants to the light aeroplane clubs is to promote public interest in flying and to encourage people who could not at present afford to pay the full cost to take up and practise flying at reduced rates. It is suggested that grants for this purpose should be continued to approved clubs upon the expiration of their present agreements for a further period of at least five years.

The matter will come before the House upon the Air Estimates and your interest and support in favour of the Associated Light Aeroplane Clubs are solicited.—Yours faithfully,

HAROLD E. PERRIN,
Secretary to the General Council.

March 4, 1929. Offices: THE ROYAL AERO CLUB,

3, CLIFFORD STREET, LONDON, W.1.

H. E. PERRIN, Secretary.

At July Olympia Aero Show

This week the ballot and allotment of space was completed for the July Aero Show, with the result that there are in the Main Hall nine chief stands, including Armstrong-Siddeley, Armstrong-Whitworth, and A. V. Roe on one; Vickers-Supermarine, Fairey Co., Bristol Co., Blackburn Co., Short Brothers, Boulton & Paul, Saunders & Parnall, besides the chief engine firms, embracing A.D.C., Bristol, Cirrus, Napier, Rolls-Royce, Sunbeam, Walter, British Mercedes, Isotta-Fraschini and Hispano. In the no less important New Hall off Hammersmith Road the chief stands are allotted to De Havilland, Handley Page, Gloster, Hawker, Westland and Ford, Cierva being in between the two Halls, whilst in the Annexe are Simmonds, the French and German National exhibits. The Air Ministry and Royal Aeronautical Society between them occupy the whole of the

gallery space of the New Hall. Last but not least FLIGHT stand will be immediately to the left of the main Hammersmith Road entrance to the New Hall. More of this anon.

Proposed Bombing Range in Solent

THE Air Ministry's proposed range for aerial firing and bombing practice in the Western Solent, west of Hurst Castle, is meeting with strong opposition in yachting circles.

Inter-Service Rugby

THE revised dates of the Inter-Service Rugby matches are as follows:—March 16, R.A.F. v. Navy; March 23, Army v. Navy; March 27, R.A.F. v. Army. In each case the matches will be played at Twickenham at 3 p.m. The R.A.F. v. Civil Service will be played, we believe, at Chiswick, on March 20.

THE AIR ESTIMATES

Sir Samuel Hoare's Speech in the House of Commons

INTRODUCING the Air Estimates in the House of Commons on March 7, Sir Samuel Hoare, Secretary of State for Air, said:—

"The net estimates for the year are £16,200,000 as against £16,250,000 in 1928. They, therefore, show a reduction of £50,000. When, however, the appropriations-in-aid for the Fleet Air Arm, and for services in India and other parts of the world, are taken into account, the gross expenditure, being £19,645,100 as against £19,135,100 in 1928, shows an increase of £510,000. The solid fact, however, for the British taxpayer to note is that whilst expenditure upon air armaments has been bounding up in other parts of the world, our net expenditure—after making allowances for alterations in the form of Estimates—for the fourth year in succession shows an actual decrease. Some of my hon. friends will no doubt think that we should be spending more and not less upon the Air Force and the development of flying. Others on the opposite side of the House, judging from their resolutions on the Order Paper, seem to think that we should be spending little or nothing upon this new arm of defence and this revolutionary instrument of communication. I can only say to my hon. friends that I most sincerely wish that the country could afford a much more generous expenditure upon our flying services. As to the hon. members opposite I shall be able to show in the course of the debate that we have an unassailable record in our efforts to avoid a competition in air armaments, and that we should welcome a reduction of air forces provided that it is general and that it does not leave Great Britain and the British Empire in a position of vulnerable inferiority.

The Principal Features of the 1929 Estimates

"There are four prominent features in these Estimates to which I would invite the attention of the House at the beginning of these debates. There is first of all the increase in the strength of the Air Force by the equivalent of seven new squadrons. These units will be allocated to the three main branches of Air Force activity, Home Defence, Imperial Security, and the Fleet Air Arm. At the end of the year, therefore, the strength of the Air Force will have been raised from 75 to 82 squadrons. Even so, our strength will fall considerably below the strength of certain other great powers.

"Secondly, these estimates mark a notable stage in the development of our Imperial air communications. The regular air service to India will begin in a few weeks' time, whilst I hope during the next few months to be able to make the necessary arrangements for the starting in due course of the other great trunk line of the Empire, London to the Cape. I shall have more to say upon this subject during the course of my speech.

"Thirdly, we have made definite provision for a further advance in technical and scientific development. Leaving out of account the larger supercut, the vote for technical and warlike equipment, shows an increase of no less than £615,000 over 1928. On the completion of this year's programme the whole Air Force, with the exception of four squadrons in India, will be equipped with new-type engines and machines. The four Indian squadrons are due for re-armament in 1930.

"Upon the civil side we are concentrating on the development of new and up-to-date types of machine for civil transport. Among the first items in our programme are a boat of new type with twin floats, a larger flying-boat than we have yet constructed, and two aircraft which we hope will enable us to test the rival claims of monoplanes and biplanes for civil purposes.

"In the meanwhile a further advance will be made in a field in which we already have the leading place in the world, the field of metal construction.

"Four years ago the Air Ministry was ordering only one metal machine to every 19 of wooden construction. Today, the orders are seven metal machines for one wood. So swift and complete has been the revolution in the methods of construction during the last four years.

"So far as engines are concerned these estimates embody a special effort that we are making to bring the progress in engine design level with the remarkable progress that has been achieved in aeroplane design during the last few years. Recent experiments go to show that pre-eminent as British aero-engines are in the world, notable improvements are within our reach, both with air-cooled and water-cooled types. The heavy-oil engine is also a development of great promise.

"A further effort is also being made to apply the data that we have now accumulated upon the risks of flying whether they be due to the structure of the machine or whether they be due to the human element. The brilliant work of the experimental pilots at Farnborough and Martlesham, and the special efforts of the Aeronautical Research Committee, are increasing our knowledge of wing-flutter and the stresses to which high-speed machines

are subjected, whilst concentrated attention is being given to possible developments of that great safety invention, the slotted wing.

"Indeed, I believe that the more the vote for equipment research and technical development is studied, the more it will be clear that we are concentrating upon the essential problems, and that we are trying to solve them with the fullest possible help of scientists and engineers both inside and outside the Air Ministry.

"Fourthly, a new proposal is made in the civil aviation vote for stimulating the air sense of the nation and for making it easier for young men and women to learn to fly. As I shall deal at greater length at some stage of the debate with the grant that I am proposing to make to the National Flying Services Company, I simply point to it here as one of the outstanding features in the Estimates, and I restrict myself at this point to the single comment that the help that we are proposing to give the company is entirely restricted to payment by results, and that not the least important condition in our agreement is the provision directly or indirectly of a hundred new aerodromes and landing grounds.

"By means of the agreement that we are making with the company we hope, if the project is successfully carried into effect, to ensure flying facilities for cities and districts that do not possess them. We hope also, to facilitate our preparations for home defence by ensuring so large a number of new aerodromes and landing grounds in the country.

Is Our Air Organisation Efficient?

"I have mentioned what I believe to be the four most significant features of these estimates. As the debate develops, I will deal with them in greater detail and with many other questions that no doubt hon. members will raise. For the moment, therefore, let me pass from detail to the broad picture of our air organisation. Is it, or is it not, efficient? Are we, or are we not, keeping abreast of new ideas and modern improvements? These are most important questions, and I do not apologise for asking the attention of the House to them.

"Let me begin my attempt at answering them by saying that, granted the obvious differences between a fighting service and an enterprise conducted for private profit, I am most anxious that a new service like the air service should not be left in any hole and corner of the national life, but should freely avail itself of the improvements in method and management that are being introduced into business and industry. There is no reason why what is called rationalisation should be restricted to undertakings for private profit. If by rationalisation is meant avoidance of waste, efficient division of labour and the encouragement of ability wherever it is found, a fighting service has as much to gain from it as any company or public utility service in the country.

"Taking then rationalisation as the text of our investigation, let us see how far we are making progress in avoiding waste and encouraging new ideas.

A Good Career for Officers and Men

"I begin with the personnel side of the question. For I suppose that at the very basis of rationalisation is the existence of a contented and efficient staff. We have had in the past formidable staff difficulties—the problem, for instance, of forming from the very beginning a new fighting service; the problem again of organising a force that needs many younger men for flying and a smaller proportion of older men in the senior posts. I think that we may claim to have made considerable advance in overcoming these difficulties. Certainly the splendid spirit of the Force is evidence against any charge of general failure. Be this as it may, we have now determined to make further use of the experience that we have gained in the 10 years that the Air Force has existed, and to introduce certain changes that, we believe, will help merit to rise to the top and provide a better career alike for officers and men. I will not now deal in detail with our new promotion scheme; I will only say that under it we are ensuring a freer stream of promotion for both officers and men; that we are allocating to non-commissioned officers certain posts that have hitherto been reserved for commissioned officers; and that we are introducing upon a larger scale civilian labour where we believe it to be more suitable than service labour. So much for the career of permanent officers and airmen. But there is also the problem of the Short Service officers, the officers who hold a commission for five years in the service and then remain four years on the reserve. Here again we have taken what we believe to be a useful step in their interests. We have started, thanks to the help that the leaders of trade and industry have given us, something in the nature of the Cambridge University Appointments Board for the purpose of finding suitable posts for these young men when they leave the service. A whole-time official looks after the work, and I am glad to say that though this



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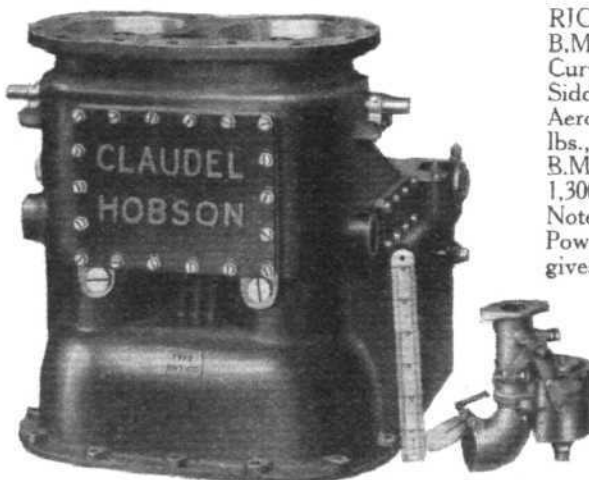
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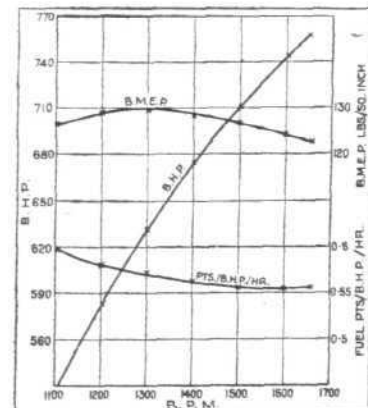
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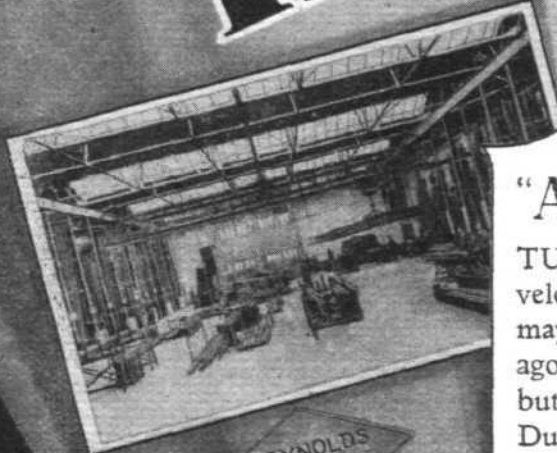
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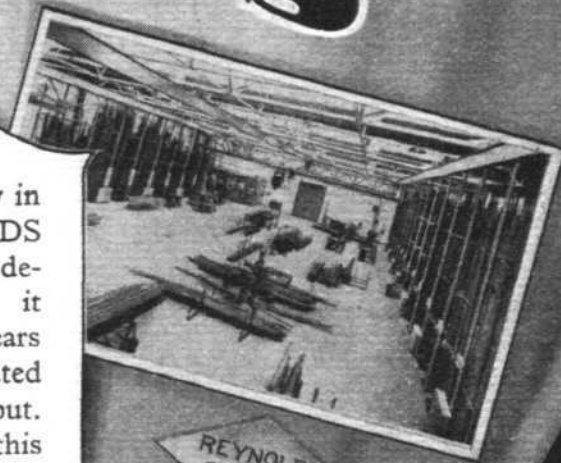
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new organisation has been in existence little more than a year, suitable appointments have been found for no less than 90 out of about 120 officers who have left the Force during the past 12 months. I should add that of the balance of 30 some have found employment of their own initiative, and others have already been placed in touch with what appear to be suitable openings.

"I believe that in both these directions, the steps that we are taking to bring good officers and non-commissioned officers to the top and the steps that we are also taking to help short service officers to find permanent employment, we are introducing improvements into the life of the Air Force which should make for the efficiency, economy and contentment of the whole service.

Labour-saving Appliances and the Avoidance of Waste

"Then there is the great problem of all industry—the avoidance of waste. Waste of labour, waste of material, waste that might reach huge figures in a service like the Air Force that needs a highly-trained personnel and an expensive equipment. In these last years we have constantly been reviewing establishments with the object of saving unnecessary labour; we have been closing, wherever it is possible, uneconomical stations. That we have not been altogether unsuccessful is shown by the fact that whilst the first line strength of the Air Force has been more than doubled since I first introduced Air Estimates in 1923, the number of personnel in Vote A has not increased.

"A typical illustration of our efforts to find economy in concentration is shown in these Estimates by the removal of the Wireless School from Flowerdown in Hampshire to Cranwell.

"Year by year the wastage of aircraft and engine spares is being reduced, and although the number of aeroplanes and engines in service is steadily increasing, it has been found possible to reduce the provision for spares by a further £136,000 after a previous reduction of no less than £200,000 in 1928.

"As for the more technical devices for avoiding waste, an instance may be found in the provision in this year's estimates for what is known as a flowmeter, an instrument invented at Farnborough for the checking of one of the biggest items in Air Force expenditure—the consumption of fuel in the air.

"Let me give the House an illustration of the value of such an instrument. Five Horsley machines were twice flown in formation at a height of 15,000 ft. for two hours, once without flowmeters and again later fitted with them. With flowmeters fitted, the consumption of petrol was materially reduced and, further, there was very little variation between the individual machines. In fact, taking as a basis of comparison the lowest of the 10 consumption figures, the consumption of the other four machines with flowmeters in no case showed an excess of more than 7 per cent., whereas when the machines were without flowmeters, the excesses were as much as 27, 29, 32, 36 and 60 per cent.

"There is further a most important provision for a seaplane tank and a variable density tunnel by means of which we hope to be able to do on models a great deal of the work which has hitherto had to be done on full-sized aeroplanes carrying their crews.

"If I had the time I could develop at much greater length this part of my argument, and I could show in detail to the House how we are constantly trying to avoid unnecessary expenditure in the use of our personnel and material. I hope, however, that I have said enough to show to the House that, although we may not always immediately succeed, we are keenly alive to these problems of method and management, and that we realise that being a new service we must keep particularly closely in touch with the world outside and the progress that is being made in it.

How Far is Our Air Organisation Carrying Out its Main Duties of Defence and Air Communication?

"I asked the question just now, Is our organisation efficient? I do not say that I have finally answered it or that anyone can finally answer it. But let us assume that I have convinced the House that we are at least working on the right lines and let me pass to my second question. Is our air organisation carrying out its main duties of defence and air communication?

"As to the air defence of these shores, I fear that I cannot tell the House that our programme is completed. There still remain to be formed 21 of the 52 squadrons that we regard as the minimum for our Home Defence and Imperial Reserve. I can, however, claim that the standard of efficiency of the units, high as it was before, has been greatly raised in recent years, and that the Auxiliary Squadrons have shown themselves so efficient as to justify our adding three squadrons to their number in these Estimates.

"As to the Air Force overseas, I can point to certain definite examples of its efficiency and of its usefulness as an economical instrument for ensuring peace. The Air Force has been on active service in the Middle East, the Sudan and India during the last 12 months. Do not, however, let anyone assume from this fact that it lightly embarks upon military operations, or is anxious to go into action. There is not a member of the Air Staff who

is not fully alive to the unjustifiable danger of unnecessary operations. There is not an officer commanding any air unit in the Middle East or India whose object is not to restore order by peaceful means and to avoid military action as long as possible. Where, therefore, air operations have taken place they have only taken place on the greatest provocation and in the last resort. It was the raving over miles of Iraq territory and the butchery of peaceful Iraqi subjects that led to the operations on the Akhwan Frontier; it was the encroachment of the Imam of the Yemen and the kidnapping of two friendly sheikhs that led to the operations in Aden; it was the brutal murder of a British political officer, a peaceful trader, and their native followers which led to the operations in the Sudan; and it was the seizure of British Indian subjects that led to the operations on the North-West Frontier. In all these operations, success was achieved, order restored and at an almost negligible cost in lives and money.

"In the course of all these operations the Royal Air Force lost only one officer in action. Heavy casualties and long-drawn-out sufferings have been spared to the enemy, and as an instance of the economy of cost it has been calculated that whilst to secure the results achieved by the Aden operations would under old conditions have cost the Exchequer at least £6,000,000; they actually cost us £8,500.

"I challenge any Member of this House to study the details of these operations and to come to any other conclusion than that the air arm was, in these cases, the most humane and economical instrument of the Pax Britannica that could have been employed.

"Lastly, there have been the Kabul evacuations. Nearly 600 men, women and children of 11 different nationalities evacuated in mid-winter over snows and mountains to safety in India. The details of this splendid achievement are so well known to the world that I need not linger upon them. I will only add one question by way of comment. Were not these pilots and machines of the Royal Air Force the outward and visible sign of the power of the British Empire for good? Here were machines brought in a day or two without clamour or public comment thousands of miles from Iraq and Egypt, and safely and swiftly flown over snow-covered mountains and a country in chaos, with the pilots and crews totally unarmed. Here were men and women, Westerns and Orientals, former friends and former enemies, evacuated with the ease and precision of a pre-war railway service in Great Britain. But here, most significant of all, was the staging of a great tragedy happily broken down by bravery, skill and modern science. What calamities might have been avoided had there been aeroplanes to rescue the beleaguered women and children in Lucknow and Cawnpore, or Cavagnari in Kabul or Gordon in Khartoum?

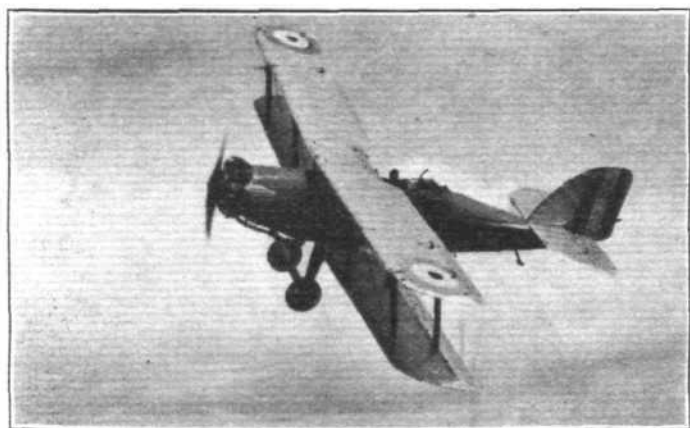
"I have in my hand a photograph of the notice board of one of the squadrons at Baghdad—a squadron of Victoria troop-carriers—whilst the evacuation operations were in progress. It is the practice to mark on the board the location of every machine belonging to the squadron. Upon the day in question two machines of the squadron are recorded at Aleppo, two others on the North-West Frontier of India, and another three on their way there. The Aleppo machines were flying back Sir Henry Dobbs, who had just relinquished his post as High Commissioner of Iraq. The machines on the North-West Frontier, or on their way there, were flown 2,500 miles to take part in the evacuation, as there were no big machines of the type in the Indian units. What better example could we have of the mobility of air power? A single squadron, whose total of first-line machines is 10, of which two are in Syria, two at Risalpur on the North-West Frontier of India, three on the way to reinforce the rescue work at Kabul via the Persian Gulf, and the remainder with the unit in Iraq. And these movements carried through with no delay and fuss, and treated as the ordinary training routine of the squadron from which the machines were sent.

"These incidents are not isolated and lucky flukes in the life of the service. They are links in the chain of evidence that proves that the Air Force, young though it be in terms of years, is fulfilling quickly, quietly and economically any task that is imposed upon it.

Imperial Air Routes

"But there is another side of the question that I have still left untouched. I said that the second objective of our air organisation should be the improvement of air communications in the Empire. And here I am including both sides of our air organisation, military and civil—the military in respect of its splendid pioneer work, the work that has shown itself in the long-distance flights that units are constantly making about the Empire, in the landing grounds that it has laid out, in the knowledge of conditions that it has gained, the civil in respect of the safe and punctual operation of air services, in respect of the individual flights of enterprising men and women, and the knowledge of air travel that it is constantly extending. Let us then, for a few minutes, survey the present state of our Imperial air routes.

"We have been criticised for going slow. Whilst the French and the Germans have been rapidly extending their air routes, the great Imperial routes of which we have often spoken have hitherto been undeveloped. As far as I myself am concerned I have always been so anxious to see these



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Imperial services started that, far from resenting criticism of this kind, I have welcomed it. It has helped me to know that a growing public opinion was in favour of projects that I have always regarded as amongst the most essential in any programme of British flying. Often, therefore, when attempts have been made to show that whilst we were stagnating, other countries were making marvellous progress, I have hesitated to make the answer that was ready to hand. I could have said that these foreign lines still need a subsidy of 70 per cent. of their actual costs of operation, and are no nearer supporting themselves than they were years ago. I could have said that our policy has been a different policy. Whilst our rivals have gone for quantity, we have gone for quality, and if we need a justification for our action it is found in the record and the safety of the British lines, and the fact that they are much nearer the point of supporting themselves than their French or German competitors. But I have never developed this answer as I might have developed it. For, being as anxious as any Member of this House or of the public to see our air lines extended, I did not wish even to appear to throw cold water upon the enthusiasm of those whose object is the same as my own. Whether or not, however, hon. members may think that we should have gone faster, they will, I know, agree with me that we have laid a very sure foundation for future progress. They will also agree with me that it is a matter of the greatest satisfaction to everyone connected with British aviation that provision for both the two trunk routes of the Empire—the London to India and the London to Cape Town routes—is made in these Estimates.

The Air Service to India

"Within a few weeks the service to India should be flying weekly and doing the journey in from six to seven days. It is now six years since I first became connected with the Air Ministry, and I can honestly say—indeed, the Department is filled with evidence to support me—that during all this time I have made the Indian route the central object of the civil aviation programme. 'Six years,' you will say, 'and yet the route is only now starting.' Yes, and I do not suppose that any similar project has ever been confronted with so many obstacles. The obstacle of money, particularly at a time when the first charge upon the Air Vote was Home Defence; political obstacles, for whilst most countries accept in theory the freedom of the air, in practice they do not always welcome the passage of foreign aeroplanes. Why, I really believe that if I had the style of my Right Hon. Friend the Chancellor of the Exchequer, I could write a book about the India air route almost as full of incident as 'The Aftermath.' As it is, hon. members must believe me when I tell them that it is not for want of trying that the air route has not been open months and even years ago. At last, however, the difficulties have been overcome and the service, the details of which you already know, is actually to be started. I need not again describe to you the route or the machines or the agreement with Imperial Airways. These things you already know. I should, however, like to express my satisfaction to the foreign Governments whose co-operation we have obtained. First of all to the French and Swiss over whose territory the first stage of the journey will be made. Secondly, to the Italians who have made an agreement under which the British machines will fly from the Alps down the coast of Italy to Sicily. To the Greeks in whose territory there will be important landing stages. To the Egyptians, who have accorded us every facility. And lastly, to the Persians who have given Imperial Airways permission to use the route along the northern shore of the Persian Gulf. I sincerely believe that the service that we are starting will not only be a great advantage to Great Britain and India, but that it will also be of no little value to the countries whose co-operation we so cordially appreciate.

"Let hon. members make a trial of it. I suggest to anyone who wants a complete change before the General Election that he should take a passage by air to India during the Easter recess, return by air, and be in his place in Parliament within a fortnight.

London to the Cape

"If the first objective of our civil flying policy has been the India service, the second has been the service of London to the Cape. The India route was inevitably the first of the trunk routes to be instituted owing to the fact that the Air Force had already organised and regularly operated a great part of it. Now, however, that the India route is starting we must concentrate our efforts upon the second great trunk route—Great Britain to South Africa. Here also, I am glad to say, we have much data and pioneer work upon which we can proceed to build. For some years past units of the British and South African Air Forces have been making service flights over the route. For some years past, also, and particularly during the last 12 months, flying pioneers like Sir Alan Cobham, Lady Heath, Lady Bailey, and Capt. and Mrs. Bentley, have been flying the whole length of Africa in civil machines. Let us pay, in passing, a tribute to all these pioneers, and particularly to the enterprising ladies who have shown so notably their skill and bravery. The result of these flights has been to give us the experience and the information without which so ambitious a scheme as an air route of 6,245 miles from the north to the south of Africa would be altogether impracticable. We have then the data. We

have also the demand for the route. There is not a Colony nor a Dominion in Africa that will not reap great political and economic advantages from it.

"Let me give the House a few instances of the savings in time which this new service will effect.

"The time taken today to travel from Cairo to Khartoum will be halved. Where as with present communications it takes 7 to 14 days to get from Cairo to Sudanese centres as far south as Malakal and Mongalla, the air service will reach both of them in 3 days or under. Entebbe in Uganda, and centres such as Nairobi, Mombasa, Dar-es-Salem, and Tabora in Kenya, and Tanganyika are at present from 12 to 15 days' journey by rail and sea from Egypt. The new air service will reduce this time by a full two-thirds.

"North and South Rhodesia will be brought within 10 days of London, whereas now the voyage and subsequent journey takes three weeks. To get to Johannesburg or Pretoria will take but 11 days, instead of 18 or 19, whilst farther south the Union Parliament at Cape Town will be brought within 12 days of Westminster.

"Can we, then, find the money for a project, at once so useful and so spectacular? I hope and I believe that we can. And I have gone so far as definitely to include a sum in this year's estimates for the starting of the project. The sum, I admit, is a small one. It is purposely small, for, with the best will in the world and with the full co-operation of all the Governments concerned, it will take at least 12 months to get the service regularly operating. I can, however, tell the House that we have made very definite progress in the last few months. In the first place, the British Government is prepared to take its share in the cost of the service. I say 'to take its share,' for I think that everyone will agree that with a route that passes through so many different territories all the Governments concerned should take their share. In this case, the British Government is already bearing the whole burden of the subsidy for the section from England to Egypt, but it is prepared to go further and to give substantial support also to the African sections provided that the other Governments concerned will play their part.

"A scheme for the route has now been worked out as a result of the joint efforts of the groups interested in the project. Upon the basis of it discussions are already proceeding with the Union Government and with the other Governments concerned, and I greatly hope that we shall be able to bring them to a conclusion that will be satisfactory to all of us. What a thrilling project! This project to unite seven Governments of the Empire in Africa in a common endeavour to destroy distance, the Empire's most formidable enemy! Here, indeed, is an unexampled opportunity for forming in the air a co-operative commonwealth of transport for the territories and Dominions of the Empire in Africa.

"During the next few months we shall do everything in our power to reach agreement upon this project which will, as I believe, confer inestimable benefits upon Africa and the Empire as a whole.

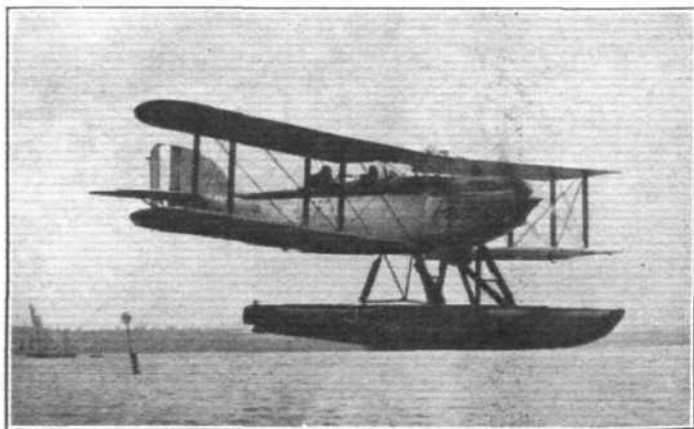
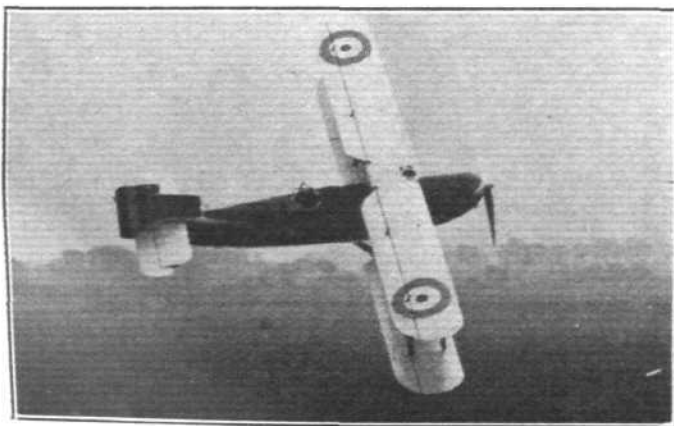
Five Years at the Air Ministry

"I am now drawing to the end of another long Estimates speech, the sixth that it has been my duty to address to the House. For more than five years the main interest of my life has been the progress of British flying. Looking back tonight in this last Air Estimates debate of the present Parliament I cannot help thinking a little of what has been done, and of what might have been done during these critical years in the life of a new service and the development of a new science. As to what might have been done, there is not an hon. member in the House this evening who cannot think of many improvements that might have been made, and many mistakes, it may be, that might have been avoided. And there is no hon. member, I may say, who could make a longer list of these might-have-beens than myself. Yet, however long may be this list, I think that we can look back with some satisfaction to the progress that stands beyond the reach of disputation.

"Where there was no organised Home Defence Force there are now 31 of the most efficient squadrons in the world, trained to the highest point to protect these shores from the most terrible of all attacks. Where few realised the value of air power in the Empire, the achievements in Iraq, Aden and India have now convinced public opinion of its inestimable importance. Where there were no Imperial air routes the work of the pioneers and the organisation of regular services are already succeeding in bringing the Empire closer together.

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"These things I mention, not because I have the right or the wish to take credit for any of them, but because I desire the House to realise the progress that has been achieved and the good fortune that I have had in tying my wagon to the flying chariot of the British airmen."

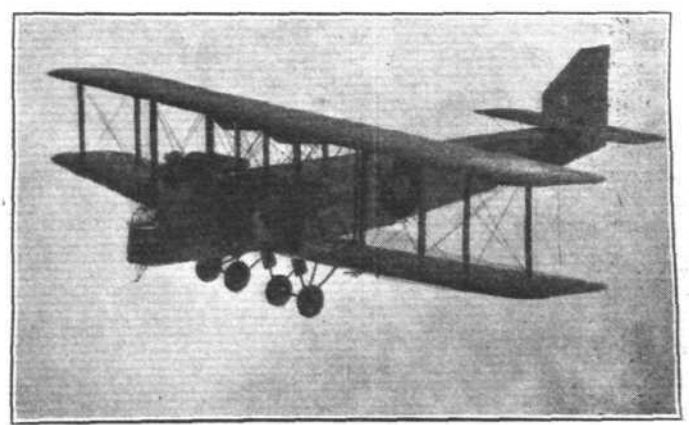
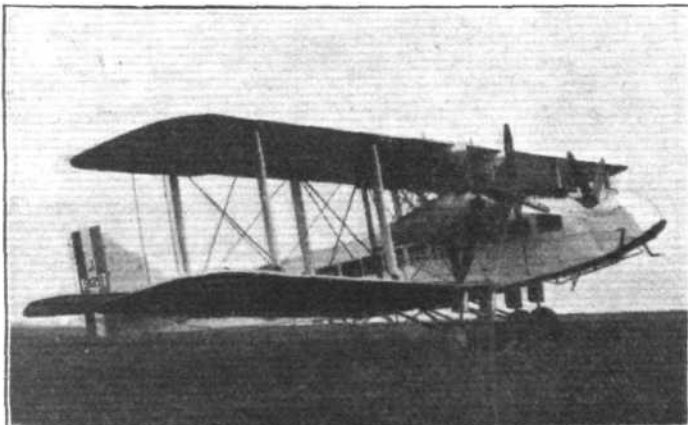
DEBATE ON AIR ESTIMATES

THE following is a résumé of the Debate on the Air Estimates which opened in the House of Commons on March 7:—

Mr. Benn (Aberdeen N.—Lab.), who opened the Debate, after congratulating the Air Minister on his address, referred to the retirement of Sir Hugh Trenchard, and wished to say, what he felt very many members of the Air Force felt, that the Service was about to lose the services of one of the greatest pioneers the Air Force had ever known. While the Air Minister's speech was extremely interesting as far as facts were concerned, he did not think the problem had been tackled which ought to have been tackled by Ministers today. The public was sick and tired of the notion of war, and was completely indifferent to any proposal to make provision for war. Fortunately, the Air Minister was in a totally different position from the War Minister or the First Lord of the Admiralty, because there was a positive side to his work; it was not concerned solely with the work of destruction, because he represented a Ministry which was charged with the development and encouragement of what he (Mr. Benn) believed to be one of the greatest potential aids for the service of humanity that science had provided. Any Air Minister would have to answer the question of what he was doing, in the absence of any international agreement, to defend this country from a sudden blow, delivered, it might be, at a few hours' notice. He would ask the Air Minister, Was there anybody in the Cabinet who, when the Service Estimates came forward, looked at all three and decided how the money was to be distributed among the three of them? That was a very important question. Or was it a case, when the Cabinet met, of the Admiralty first by virtue of seniority, then the War Ministry by virtue of pertinacity, and then the Air Ministry, last of all, taking what was left? Were dress allowances to be made to both the ugly sisters, and was the Air always to sit among the cinders? He thought there was no safety either in the Air Force or any other form of armament—the only safety was in disarmament. He, therefore, asked the Air Minister what had been his contribution towards the settlement of this vital question, the reduction of the most dangerous and devilish of all weapons of war? What had the Cabinet done, if they could not do anything at Geneva towards general disarmament in connection with our nearest neighbours? Had they done anything at all? We had entered the Covenant of the League of Nations; we had forgiven the debt, or a great part of it; we had signed the Kellogg Pact; we had undertaken under the Locarno Treaty to defend French territory. What had we in return? Was it impossible to conceive that we could have made some agreement which, at any rate, would have relieved us of what he admitted was a potential danger, against which the Air Minister was perfectly right to place us in a condition of adequate defence? As regards the positive side of the work of the Air Ministry—Civil Aviation—he believed that it would be a disastrous thing if the pursuit of disarmament led us to do anything to lame or hamstring this enormous human development. Its potentialities were immense, and no one had spoken of it better than had the Air Minister himself. He believed in civil aviation. It was essential that we should be in free and open communication not only with our own Dominions, but with every part of the world. What was the Minister doing to secure for Great Britain in the air the position to which we were entitled? The air should be an open highway for all the peoples of the world, and we should contribute our part to making it so. (Mr. Benn here gave comparative figures regarding mileage, number of aircraft, aerodromes, etc.) If Imperial Airways really meant concealed military approaches, that would be entirely out of harmony with the spirit of the times. Which country, if they were going on with the process of war, really had today the leadership of Europe? He did not think that many people would hesitate to say that it was Germany, disarmed as she was by the Peace Treaty. She had an enormous civil flying machine and potential accumulations of stores and mobilisation arrangements, and, what was much more important, the practised pilot. The real problem facing the Air Ministry today was—What were they going to do to promote the development of civil aviation and yet prevent it from being turned to purposes of war? He suggested there should be some universal treaty which would give freedom of the air to those who were prepared to accept in return the obligations of internationalisation, and to keep their particular machines and lines out of the power of their own national war offices, so that if war did break out the great international air lines could take no part, because their pilots were internationals and the whole framework—staff, machinery, etc.—would be swept aside out of the control of the War Ministries in every country.

Lieut.-Col. Moore-Brabazon (Chatham—Con.) also paid tribute to Air Marshal Trenchard, and referred to the question of the position (promotion, etc.) of Air Force officers. Regarding national flying services, he supported these with all his heart. In 1924 he had advocated the formation of flying clubs, but though these were all very well in their way, there were, after all, only a limited number of people who wanted to go up for the mere pleasure of flying. If there was one person who would go up for joy flying, there were 50 who wanted to get something out of it in the way of flying from place to place, and that was the next step in the development of this branch of flying. The possibility of exploring the whole of England was opened up, and he hoped that the old flying clubs, which had done so much service, would not put a spoke in the wheel of the advance. Within its own ambit the Air Ministry did its duty very efficiently, but he had a complaint against the Government as a whole. The House had been promised a day in which to debate national defence as a whole. When were they going to have that day? As taxpayers they wanted a reduction of national expenditure, and they did not see any way of getting it except along that line, and as the people who vote the money they were going to have it. He did not say it was necessary to have a Ministry of Defence—that was a thing to be inquired into. But the Commons of England had a right to talk about that subject in its entirety. Mr. Churchill had put the Air Force in charge of Iraq and Transjordan, and we had saved millions of pounds thereby. But what about the Sudan, Somaliland, the Indian frontier and coastal defence? Surely along those lines there was a possibility of national economy. The Prime Minister said at the beginning of the present Parliament that he would hack a way through the vested interests that lay in the way of progress. If he had hacked his way through the two great vested interests of the War Office and the Admiralty there would have been a general lessening of armaments today, even though more had been spent on the air. Peace in our time, the speaker said in conclusion, did not mean somnolence on the front bench. The snores of the Government were echoing through the country.

Capt. Guest (Bristol N.—Lib.) said that in view of the additional duties the Air Ministry had taken on their shoulders these Estimates were an absolute model of economy. Referring to the policy of substitution, which he was satisfied would be successful, he thought this problem should be examined more closely, and he asked why should we not have some substitution for the Navy? The taxpayer could be saved untold millions by the Air Force taking over Malta. As one particularly interested in civil aviation he was glad to hear that the Cape to Cairo service, in regard to which, when he pressed for it last year, he was told he would have to wait for three more years before it could be undertaken, was now being pushed forward. He congratulated the Minister on his success. It was the first milestone in the right hon. gentleman's programme of an Imperial Air Service. Questions had been asked about the Civil Aviation organisation which he had been attempting to launch in this country. He had felt that it was not fair for one to be asking questions in the House with regard to civil aviation unless one took off his coat and tried to do something himself to advance it. The success or failure of his scheme meant nothing to him in any shape or form. He was not getting any fee from the company. He thought the London area was badly provided with flying facilities. In the flying clubs there were long waiting lists of men anxious to fly, but who could not obtain either accommodation or material. He and his friends put their heads together to see whether they could not start a larger organisation. During the negotiations they heard of a much wider proposal in the hands of Col. Edwards, and they got together and amalgamated the two schemes. The Air Ministry, having carefully investigated the proposed organisation, came to the conclusion that it would be of great benefit to the country in providing aerodromes, landing grounds, and a reserve of trained pilots, and an agreement was reached which was set out in the White Paper. He regretted the squabble between his organisation and the Light Aeroplane Club. That was the one thing he wanted to avoid from the very start, and therefore he laid his scheme before the General Council of the clubs, explained it to them personally, and got from them the assurance that his scheme was not in any way trespassing on the ground they had already marked out for themselves. There had been some little rift in this agreement, but he thought it could be settled. They were a very valuable organisation, and it would be a great pity to let them disintegrate for the want of a few thousand pounds. The organisation which he had tried to set up had two main objects. First, it met the needs of the private owner; and, secondly, it would help to develop in this country an internal service by commercial taxi-services. It had a great deal more in it than joy-riding; time was money, and to the salesman the real value of cross-country flying lay in the fact that he could be carried across country in one-third of the time taken by train. It would provide the State with a reservoir of pilots, uniformly trained, and it would give employment to a certain number of short-time officers. There was also the advantage to the nation, admitted by the form in which the grant was given, that more aerodromes would be available for military purposes. In conclusion, the hon. and gallant member joined in the tribute paid to Sir Hugh Trenchard, but for whom, he said, there would have been no independent Air Force.



RE-EQUIPPING THE ROYAL AIR FORCE

The Handley-Page "Clive" Troop Carrier, two Bristol "Jupiter" engines.

The Handley-Page "Hinairi" Bomber, two Bristol "Jupiter" engines.

Capt. Reid (Warrington—Con.) said that the defence of the country had developed into a vicious circle, and he endorsed every word that had been said on the subject by the Member for Chatham (Lieut.-Col. Moore-Brabazon). Given the slightest opportunity, every one of the three Services was prepared to embark on a programme which meant a considerable increase. It was incumbent on the House to decide, consistently with economy, which, if any, of the three Services was correct in its claims. We ought, once for all, to give up the policy of *laissez faire*. But the trouble was that the two senior Services had dug themselves in very comfortably. They refused to learn any lessons from the war, or to move one inch. Geographically situated as we were, this country, of all countries in the world, was the most vulnerable to air attack. Putting this together with the fact that go-ahead civil aviation was essential to sound defence in the future, the following figures were somewhat significant. Great Britain possessed to-day a total of but 21 commercial machines, while Germany and France each possessed several hundreds. Of the 42,200 miles of air routes in Europe, Germany had 18,000 miles, France 12,500 miles, and Great Britain only 1,080 miles. During the summer of 1928 German commercial aircraft flew 40,000 miles daily, against our daily average of 3,000 miles. These figures spoke for themselves. By spending more on the Air Force and less on the Army and Navy they would not only benefit the National Exchequer, but also add to the security of the country.

Mr. James Hudson (Huddersfield—Lab.) said he would ask, as he had at previous debates, what good should we do, even from the point of view of defence, by the spending of this money in the provision of 32 so-called home defence squadrons—or the 52 squadrons towards which the Air Minister is working? He did not believe that in the long run any money spent upon the air could ultimately secure the defence which was pretended. The way out of the situation was for the Foreign Secretary to come to an air agreement with our nearest neighbour. He said that when he went to Canada last year he found tremendous strides had been made with their Air Force for civilian ends. He felt that if the money that was being voted had for its purpose the greater development of routes and communications and the like, they would make no more objection whatever, and would give the Minister their hearty support.

Rear-Admiral Sueter (Hertford—Con.) said he considered the Air Minister had not secured enough money for the Air Service. For the third year in succession he had taken one-seventh of the amount allotted for the fighting Services, and he believed the country could afford more. He could not understand why the Navy took half the money allotted for defence. This was a case where we wanted a Ministry of Defence to go into the whole question of the expenditure on the services. They had only to pay off two or three battleships, and they would have plenty of money for the development of civil aviation. It was high time that the Navy was forced to give up some money in order that civil aviation could be developed.

(Rear-Admiral Sueter also asked questions regarding the Handley Page slots, parachutes for sea-going aircraft, and airships. He also referred to the air rescues from Kabul.) In conclusion, he said that when the present Prime Minister came into office again—he knew he would—he hoped he would not have the right hon. gentleman (Sir Samuel Hoare) as Minister for Air, but would select him as Minister of Defence.

Mr. Garro-Jones (Hackney, S.—Lib.) congratulated Capt. Guest on the services he had rendered to civil aviation, but he criticised the National Flying Services scheme as one which would be likely to give a severe setback to civil aviation. He objected to the scheme because he believed it was going to fail. If the company were to secure a subsidised monopoly, it would destroy its competitors and in five or ten years, when the Secretary for Air looked for civil aviation development, he would find that the company upon which he had relied had failed to deliver the goods, and that the other subsidiary organisations had been destroyed by its operations. The scheme was opposed by practically every aviation interest and by independent critics in every sphere of aviation. Regarding civil aviation in other parts of the world, he stated that in our overseas territory and in the internal territory of this country there had been no development of civil aviation. There had not been a single new line started within the borders of this country during the past five and a-half years; there was not a single regular seaplane service flying in the home waters of these islands, yet one would have thought that of the possible lines of development for us, a maritime nation, we should have done something to develop the seaplane service. In every part of the world we were being left behind by other countries in the development of civil aviation. That lamentable position was, he thought, due to the attitude of the Air Minister in refusing to pay a subsidy to any company for developing a British air line abroad without consultation with Imperial Airways. Did it mean that any company which brought forward plans for a British air line abroad could secure a share of the subsidy paid to Imperial Airways? (Sir Samuel Hoare here stated that in considering any proposal he would naturally take the best.)

Sir Harry Brittain (Acton—Con.) said it was agreed that in personnel and material British aviation was second to none, but it had dropped most painfully from its record at the head of other countries. He would like to

add to the comparative figures already given as regards the United States. In 1927, 1,600 machines were turned out; in 1928, 5,000; and for 1929 it was expected to be 12,000. It had not been stated that of the 12,000 miles of air routes in America, 8,000 were open for night flying; we had been given the number of aerodromes, but were not told that over 2,000 cities had air ports or land marked for the purpose, and throughout the country over 400 chambers of commerce from San Francisco to New York had aviation centres. He would like to ask the Air Secretary a question with regard to the West Indies. Was it still too late to get a British flying-boat service there? He was told on the last occasion that it was a job for the West Indian Government, but he would point out that in these centres of population, 50 miles apart, it was very difficult to take the lead. They were not a Dominion. On the few occasions they got together they had to do so by boat—a very long and tedious operation. He did not know any part of the world where a seaplane service would be more useful than in the West Indies, which were the nearest link between North and South America. We must let the people of these islands realise what flying-boats could do. The perfectly splendid flight of the Royal Air Force to Australia, round Australia, up to Hong Kong and back to Singapore, certainly the finest flight ever made by any squadron, showed what magnificent machines British flying-boats were, and if we could only get a squadron to go out there and show the West Indies what flying-boats could do they would, he thought, make a start in this direction. But could we not also give them help from the Mother Country?—it would be a pity to hand this over to the Americans. While he had great admiration for Imperial Airways it seemed impossible for one monopoly to develop all the possibilities of aviation in every section of the Empire.

Lieut.-Com. Kenworthy (Hull Central—Lab.) also referred to seaplane services, with special regard to Hull, and he considered the Humber suitable in every way as a seaplane port. He pointed out that there were no signs in the estimates, the right hon. gentleman's speech, or the memorandum that there had been any change of policy as a result of the signing or ratification of the Kellogg Pact.

(Debate interrupted for private business, and continued later.)

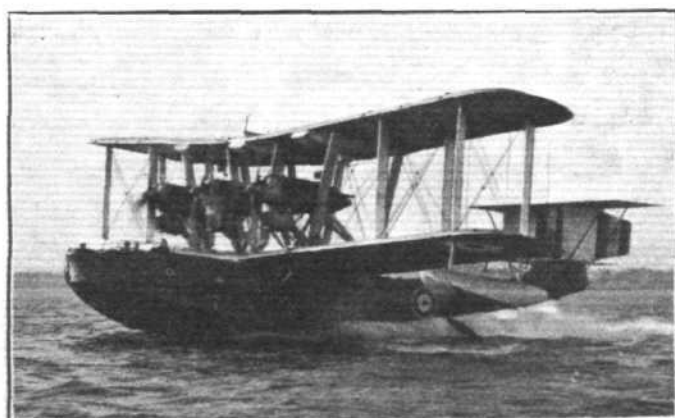
Major Hills (Ripon—Con.), regarding civil aviation, said people might attack Imperial Airways as much as they liked, but route miles and miles flown were valueless for comparison. The real test was passengers and tons carried per mile flown. On the question of disarmament he believed a Minister of Defence would cause a big reduction in the amount we spent on our Navy, and that would forward disarmament more than anything else.

Lieut.-Commander Burney (Uxbridge—Con.) said it was magnificent that although the estimates of £20,000,000 were mainly for war purposes, with £500,000 for civil aviation, every speech which had been made had dealt almost exclusively with civil aviation. It may be that that reflected a realisation on the part of the public as a whole that we were now within measurable distance of making civil aviation fly by itself. He thought the Secretary of State for Air ought to be congratulated on firmly adhering to the policy of one monopoly company which was laid down in the initial stages, and not being influenced by the specious arguments of those who did not understand the facts of the situation. He considered that the Air Force at its present size would not be a fortnight's supply of men and machines on the scale in which they were used in the late war. He did not think that in an endeavour to re-create the economic security of the Empire it would be too much to use 10 per cent. of what was devoted to defence on forcing civil aviation along. Civil aviation, he said, must be developed on an international basis; it could not be developed in any other way. The more international barriers were broken down, and people thought internationally, the more it would be realised that war between civilised and contiguous countries was nothing but civil war.

Sir Philip Sassoon (Under-Secretary for Air), replying to the debate, said the Air Ministry had 115 aerodromes and landing grounds. The Ministry was fully alive to the fact that it had not got enough of these and that was one of the reasons why this flying service scheme should come in, as it would provide 100 more aerodromes. With the new routes and the extensions from India to Australia and elsewhere we would have 22,000 miles of air routes which was better than in the German Empire. The question of a combination of air and railway services was not being lost sight of. Part of the new Indian Air Service would be supplemented by the railways. The trunk air lines which the Air Ministry was developing would be open highways for all countries. The trial flights of the airships would take place in the spring. He could not follow the grievance in connection with National Flying Services, and thought they would give us more pilots, that we would get payment for results, and that we would get many more aerodromes. In spite of all that we would not in any way interfere with existing light aeroplane clubs, but, on the contrary, in a great many cases, help them. The Secretary for Air was the originator of the scheme of light aeroplane clubs, and no one was more anxious than he that they should succeed.

Labour Motion on Disarmament

Mr. Bellamy (Ashton-under-Lyne, Lab.) moved the following resolution—



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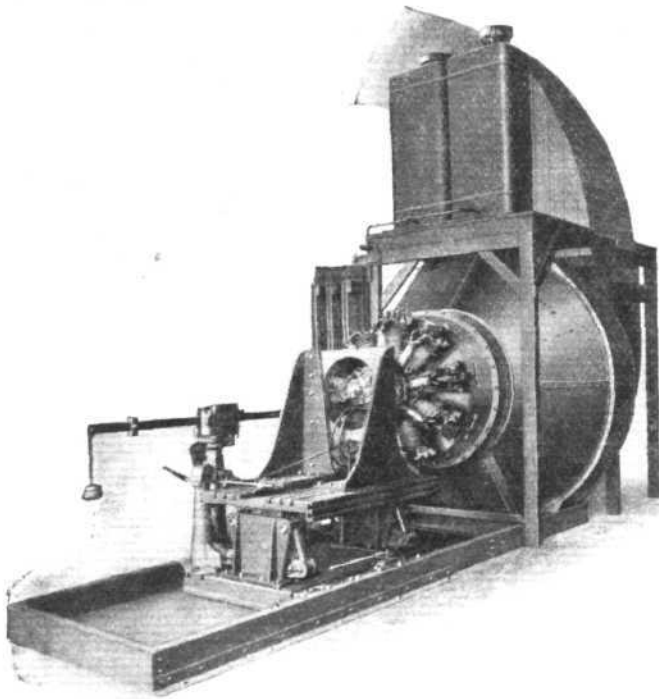
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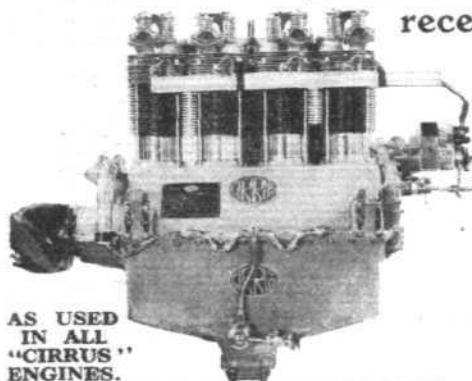
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That, in view of the growing menace to civil communities in the development of methods of air warfare, this House regrets that His Majesty's Government have failed to make any proposals for securing international agreement on the question of aerial disarmament, and urges them to take the initiative in proposing a programme for the abolition of military and naval air forces and the establishment of international control of civil aviation."

He said that the experience of the late war had shown that the use of air science for military purposes was inhuman, and one which, if it was allowed to continue, would mean the ultimate end of civilization.

Mr. Malone (Northampton—Lab.), in seconding the resolution, said he did not think there was any topic, or policy, more vital than disarmament. It should be approached from a consideration of all three Fighting Services. There was a very strong feeling in the House for the formation of a Ministry of Defence, and he believed it would receive support from members of all parties. He thought that properly handled and directed civil aviation might be the greatest factor for world peace that we could have.

Col. Heneage (Louth—Con.) said they were all in favour of the abolition of war, but he did not think the world was sufficiently advanced and civilised to accept the total abolition of all naval, military and air forces. He thought that at present the air sense of the country was in need of development. It was difficult to get sites for aerodromes and landing stages outside towns and cities, and they were not included in town-planning schemes.

Mr. Stanford (Leeds W.—Lab.) said that during the past ten years there had been a succession of conferences, pacts, and agreements on war and disarmament, yet all these put together had not helped the world forward a single step towards the realisation of any real measure of disarmament. The present competition among nations in armaments would end in war between the civilised nations of the world.

Sir P. Sassoon, replying, said that in urging the Air Ministry to be willing to take its part in a scheme of all-round disarmament, the supporters of the resolution were forcing an open door. The Air Ministry did not yield either to the army or the navy in a desire to be associated with such a scheme. The Air Ministry was also equally concerned with the other services in the matter of national economy. Drastic as were the reductions in the naval and military forces after the war, the reductions in the air force were more drastic still. From being the first air power in the world we had sunk to the fifth, in spite of the fact that the air weapon had lost for us our age-long security as an island nation and had made the greatest city in the world more open to air attack than any of the other capitals of Europe. We had made proposals in regard to the question of international agreement on air disarmament. At the meetings of the Preparatory Commission at Geneva a formula had been agreed on. That formula was a combination of the strength of first-line machines plus the horse-power of the engine. It was due chiefly to this country that so much progress had been made. There was now little more that the Preparatory Commission could do, and it was up to the countries and governments concerned to apply the agreed principle. This country was not the country that should take the first step in that direction, because no one could say that Great Britain had shown the slightest intention of engaging in a race for air armament. We were the only nation that could show in the past five years consistent reductions in our Air Estimates below the figures of 1925, but man for man and machine for machine, our Air Force could more than stand comparison with the Air Force of any other country. In all questions of international disarmament it was the power that was strongest in the weapons concerned that could put forward proposals for reduction with the greatest hope that those proposals would be accepted. The concluding sentence of the Amendment advocated the international control of civil aviation. That proposal was also made last year, and the House was then satisfied with the arguments advanced against it. The situation had not changed since then, and the arguments presented then still held good. The difficulty was that the air transport companies of Europe were not State-owned. They were commercial enterprises and the difficulties in the way of nationalising them would really be insuperable. Moreover, if by some miracle, those difficulties could be overcome, the object which hon. members opposite sought to obtain would still be no nearer, because

in order to meet the needs of the nations concerned the machines would still have to be located in centres and at aerodromes as they were to-day, and it would be no more difficult than it would be to-day for any ill-disposed persons to commandeer all the machines and put them to any military use which was desired.

The amendment was defeated by 152 votes to 65. The vote for men, and the various votes for money were agreed to.

THE NAVY ESTIMATES

THE following are points concerning aviation brought out in the statement explanatory of the Navy Estimates, 1929, presented by the First Lord of the Admiralty to Parliament, issued on March 8 as a White Paper (Cmd. 3283, 3d. net):—The net total of Navy Estimates for 1929 is £55,865,000, which is a reduction of £1,435,000 below the Estimates for 1928. This considerable reduction is being made, although no diminution in strength of the Fleet and the Fleet Air Arm has taken place, and, on the contrary, modern developments have shown the necessity for two additional flights for the latter.

The provision under Vote 4 for the Fleet Air Arm is increased by £220,000 principally in order to meet the cost of a further instalment of aircraft (two flights) for the *Glorious*. This vessel will complete her reconstruction as an aircraft carrier and be commissioned during 1929, but under the modest programme which they are following she will not have her full equipment of aircraft until 1930.

The advancement of the new construction programme and of the Singapore Naval Base, and the gradual expansion of the Fleet Air Arm have been since 1925 the main developments which they have kept in view. In the meantime, their policy has been to effect economies wherever possible in the maintenance charges of the Navy in order to offset the expenditure on those three main objects.

The aircraft-carrier which was to be commenced in 1929 will not be proceeded with this year, as it is desired to obtain more experience with the *Courageous* and *Glorious* before laying down another large aircraft carrier.

The reconstruction of the *Courageous* as an aircraft carrier was completed in May, 1928. The reconstruction of her sister ship, the *Glorious*, is expected to be completed in the latter part of 1929. The *Courageous* has joined the Mediterranean Fleet. The *Glorious*, when her conversion into an aircraft carrier is complete, will replace the *Argus* in the Atlantic Fleet.

Steady progress continues to be made in the employment of aircraft with the Fleet, and the number of hours flown from the carriers has increased by 73 per cent. over the preceding year. Seventy-four naval officers have been trained and are employed as observers, and eight more are under training. One hundred and twenty-one naval and R.M. officers have been trained as pilots, and 12 more are under training. Of this total of 121, 19 officers have reverted for a period of general service, on the conclusion of which they will resume flying duties.

Steps have been taken to bring the service of naval officer pilots in the Fleet Air Arm into line with ordinary naval specialized service (gunnery, torpedo, etc.), and such officers, provided they remain fit and suitable for service in the Fleet Air Arm and also willing to serve as pilots, will, in future, serve on flying duties for the whole of their time after selection until they reach six years' seniority as lieutenant-commander, except for a minimum period of two years' general naval service as lieutenant or lieutenant-commander. Those who do not wish to continue on flying duties after four years of such service may revert permanently to general service or apply to specialize in another subject.

Progress in utilizing the latest improvements in radio-telegraphic technique continues to be made, both in connection with work in the Fleet itself and communications with shore stations and Admiralty. Close collaboration continues with the Army and Air Force on technical matters connected with wireless telegraphy, and is of the greatest benefit to all three Services.

Catapults of different types for the launching of aircraft are now on trial and in process of development.

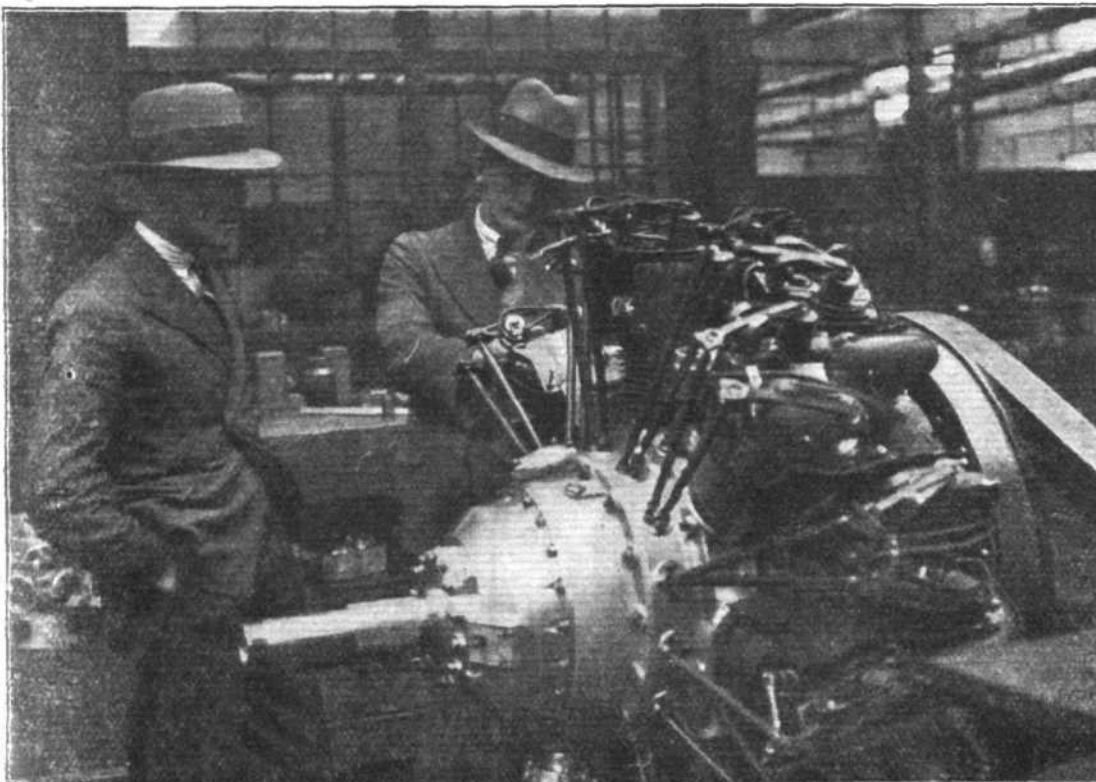
To the Grand National by Air

THE Automobile Association has made arrangements for a landing ground to be at the disposal of members for the Grand National on March 22. Members who contemplate flying to the meeting are asked to supply full particulars

to the Automobile Association, Aviation Department, Fanum House, New Coventry Street, London, W.1.

Glasgow Indignant

GLASGOW councillors have strongly criticised an Air Ministry refusal to contribute towards a municipal aerodrome.



For the Australian Flight: Our picture shows Flt.-Lieut. Moir and Pilot-Officer Owen inspecting the Armstrong-Siddeley Geared "Jaguar" engine which will be fitted to the Vickers "Vellore" machine on which they hope shortly to fly to Australia.

THE ROYAL AIR FORCE

London Gazette, March 1, 1929

General Duties Branch

The following are granted short-service commns. as Pilot Officers on probation, with effect from and with seniority of February 22:—R. J. Axten, R. E. H. Beaton, E. D. Bishop, G. H. A. Blackwood, A. F. C. Booth, R. C. A. Brooke-Beer, E. A. Cooke, R. A. Davies, C. S. Gill, F. R. W. Goad (Sec.-Lt., 52nd (Kent) Medium Brigade, R.A., T.A.), T. W. Hoyle, M. M. Jackson, L. E. Jarman, E. H. Jennings, G. P. Longfield, G. P. Marvin, V. R. Moon, G. E. Mustard P. J. Pratt, H. D. Primrose, W. M. Rankin, G. N. Roberts, H. L. Smith, D. W. Smythe, R. M. Swaine, A. C. Watson, T. H. Wilson.

L. V. G. Barrow is granted a short-service commn. as Pilot Officer on probation, with effect from and with seniority of Feb. 7 (Substituted for *Gazette*, Feb. 19.) The following Pilot Officers are promoted to the rank of Flying Officer:—N. A. Pearce (March 24, 1928), I. B. Beesley, P. W. M. Wright, M. G. Sedorski (Jan. 18), J. W. Gillan, M. G. Philpott (Jan. 30).

Group Capt. H. R. Busteed, O.B.E., A.F.C., is placed on half-pay list.

scale A (Feb. 19). Sqdn.-Leader P. A. Shepherd is placed on retired list and is granted permission to retain the rank of Wing Commander (Feb. 24). Pilot Officer on probation E. D. Mills is transferred to Reserve, Class A (Feb. 28).

Medical Branch

The following are granted short-service commns. as Flying Officers for three years on active list, with effect from and with seniority of the dates stated:—A. E. Vawser (Feb. 1); P. J. McNally, M.B. (Feb. 12).

RESERVE OF AIR FORCE OFFICERS

General Duties Branch

Flying Officer L. R. Stooke relinquishes his commn. on account of ill-health and is permitted to retain his rank (Feb. 27). Pilot Officer L. V. G. Barrow relinquishes his commn. in the Special Reserve on appointment to a short-service commn. in R.A.F. (Feb. 7). (Substituted for *Gazette* Feb. 19.)

IN PARLIAMENT

Bombs in Warfare and Disease Germs

LIEUT.-COMMANDER KENWORTHY, on March 5, asked the Secretary of State for War whether the War Office has information to the effect that bombs or shells carrying disease or plague germs were used by the German forces on the Western Front during the Great War?

Sir L. Worthington-Evans: No, sir. The War Office has no other information than that contained in the "Official History of the War," Vol. II, Medical Services, Chapter 17.

Kabul Evacuations

MR. DAY asked the Secretary of State for Foreign Affairs whether all British subjects have now been evacuated from Kabul; and can he give the total number of evacuations to date, stating the nationalities of the persons so evacuated?

MR. LOCKER-LAMPSON, on March 6, in reply to Mr. Day, said a number of British subjects from India elected to remain in Kabul. The following persons of various nationalities were evacuated from Kabul by the Royal Air Force between December 23, 1928, and February 25, 1929: British subjects, 369; Afghans, 36; French, 23; Germans, 57; Italians, 19; Persians, 25; Rumanians, one; Swiss, one; Syrians, five; Turks, 49; United States citizens, one—making a total of 586, of whom some 300 were women and children. There are, I think, subjects of other nations still there.

Atlantic Flights and Anchored Islands

VISCOUNT SANDON asked the Secretary of State for Air whether he has entered into any arrangement or understanding with the American promoters of the scheme to lay down permanently anchored islands for the use of aircraft at regular intervals across the Atlantic, the first of which is to be started immediately; what are the terms and conditions of their use by British aircraft; whether he will first of all take engineering advice as to the safety of this device; and whether it is to be armed for defence?

Sir P. Sassoon: I am aware that the scheme referred to has been proposed in America, and any development of it will be closely watched by the Air Ministry, but no question has arisen of entering into any arrangement or understanding with its promoters. The answer to the first part of the question is, therefore, in the negative, and the remaining parts do not arise.

R.A.F. Bombing Squadrons

MR. THURTELL asked how many of the proposed additional squadrons for home defence will be composed of bombing machines and how many of the existing home defence squadrons are bombing squadrons?

Sir P. Sassoon: The answer is four squadrons, of which one will be a cadre squadron and three Auxiliary Air Force squadrons. The home defence force at present includes 19 bombing squadrons, of which eight are cadre or Auxiliary Air Force squadrons.

MR. THURTELL: In view of the fact that all these bombing squadrons will necessarily be employed in offensive operations overseas, does not the hon. baronet think it is a misnomer to call them home defence squadrons?

Sir P. Sassoon: No, sir.

AIR MINISTRY NOTICES TO AIRMEN

Biggin Hill: Night Flying without Navigation Lights

PILOTS are warned that an aircraft may be flying over the area comprised within a circle of 10 miles radius from Biggin Hill Aerodrome, after 21 00 hours, on any night from March 4, 1929, to April 22, 1929, inclusive, and that, above an altitude of 4,000 ft., the aircraft will not exhibit navigation lights. Attention is drawn to the fact that the area in question includes Croydon Aerodrome.

(No. 9 of the year 1929.)

Croydon: Night Landing Arrangements

1. THE automatic night-landing sign installed at Croydon aerodrome, and hitherto exhibiting lights arranged in the form of a double L, is to be dismantled and is no longer operated.

2. Pending the installation of new apparatus, the direction for landing will be indicated at night by the mobile floodlight, the beam of which will be directed up-wind. Aircraft should therefore approach over the floodlight and land up the centre of the beam.

3. In the event of the floodlight becoming unserviceable, the direction of the wind will be indicated by means of flares placed in the form of a T. In this case, aircraft should land parallel to the long arm of the T and towards the cross arm. Landings may be effected on either side of the long arm.

4. *Air Pilot*.—Page 74 of the *Air Pilot* for Great Britain is affected and will be amended in due course.

(No. 11 of 1929.)

Night Flying Without Navigation Lights

PILOTS are warned that an aircraft may be flying over the area bounded by Reading, Egham, Guildford and Alton, on any night from March 10, 1929, to June 30, 1929, inclusive. Above an altitude of 2,000 ft. the aircraft will not exhibit navigation lights.

(No. 10 of 1929.)

Accidental Ignition of Holt Flares

IN consequence of the recent accidental ignition of a Holt flare whilst the civil aircraft to which it was fitted was standing in a hangar at Croydon Aerodrome, owners of aircraft and proprietors of civil aerodromes are strongly advised to ensure that both the leads to all Holt flares are disconnected before the aircraft is placed in a hangar.

(No. 12 of 1929.)

NEW COMPANIES REGISTERED

NORTH BRITISH AVIATION CO., LTD., Hooton Aerodrome, Cheshire.—Capital £1,500, in £1 shares. Aeroplane designers and constructors of propeller accessories, motor manufacturers and carriage builders, flying instructors, etc. Directors, E. E. Freeson and L. J. Rimmer.

IMPELLER CARBURETTER, LTD.—Capital £5,250, in 5,000 "A" shares of £1 each and 5,000 "B" shares of 1s. each. Acquiring from M. McGuinness an invention relating to carburettors. Solicitors, Ashurst Morris, Crisp and Co., 17, Throgmorton Avenue, E.C.2.

THE FAIREY AVIATION CO., LTD., Cranford Lane, Hayes, Middlesex.—Capital £500,000, in 10s. shares. The objects are to enter into seven agreements with the Fairey Aircraft Holdings Co., Ltd., C. R. Fairey, F. G. T. Dawson, M. E. A. Wright, A. G. Hazell, T. M. Barlow and W. Broadbent, respectively, and to carry on the business of manufacturers of seaplanes, aeroplanes and aerial conveyances and aircraft of all kinds, and the component parts thereof, including engines and all kinds of machinery and apparatus for use in connection therewith, builders of hangars, garages, aerodromes, etc. First directors: C. R. Fairey, F. G. T. Dawson, M. E. A. Wright, A. G. Hazell, T. M. Barlow, W. Broadbent. The Board shall not, without the sanction of a general meeting, borrow or raise any money which will make the amount borrowed or raised, and then outstanding exceed the nominal capital. The company in general meeting may declare a dividend to be paid to the members according to their rights and interests in the profits, but no larger dividend shall be declared than is recommended by the Board, and no dividend in excess of 20 per cent. per annum shall be declared whilst an issue of £800,000 debenture stock about to be created by the company or any part thereof is outstanding.

AERONAUTICAL PATENT SPECIFICATIONS

(Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motor. The numbers in brackets are those under which the Specifications will be printed and abridged, etc.)

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Published March 14, 1929

- 24,351. S. LINDEQUIST. Lubricating the pistons and cylinders of high altitude i.c. engines. (306,161.)
32,753. A. E. L. CHORLTON. R. A. DE H. HAIG, and H. J. STIEGER. Wings. (306,220.)

APPLIED FOR IN 1928

Published March 7, 1929

- 4,253. DUNLOP RUBBER CO., LTD., and J. WRIGHT. Aeroplane wheels. (305,817.)
5,890. O. E. SIMMONDS. Aeroplane wings. (305,837.)
9,186. S. E. SAUNDERS and H. KNOWLER. Heating of aircraft. (305,865.)
18,437. R. P. FOX. Dirigible airships. (305,898.)

Published March 14, 1929

- 10,544. F. J. W. and P. A. PURTON. Sustention and/or propulsion of aircraft. (306,317.)
17,365. BENLIX BRAVE CO. Control of aircraft. (292,504.)
18,831. L. STEIN. Airplanes. (306,355.)

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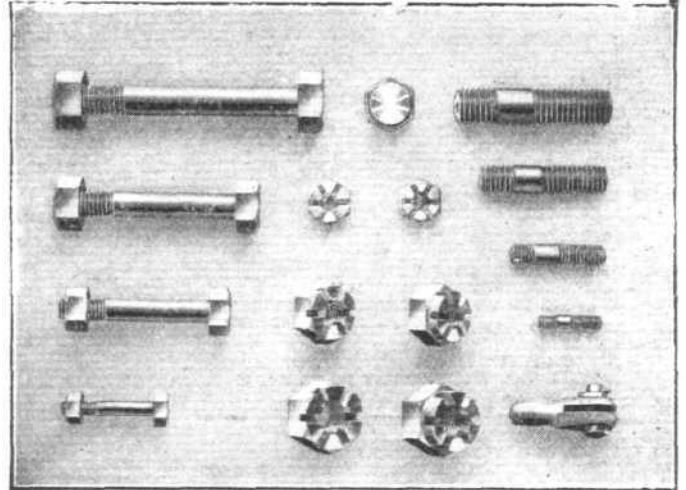
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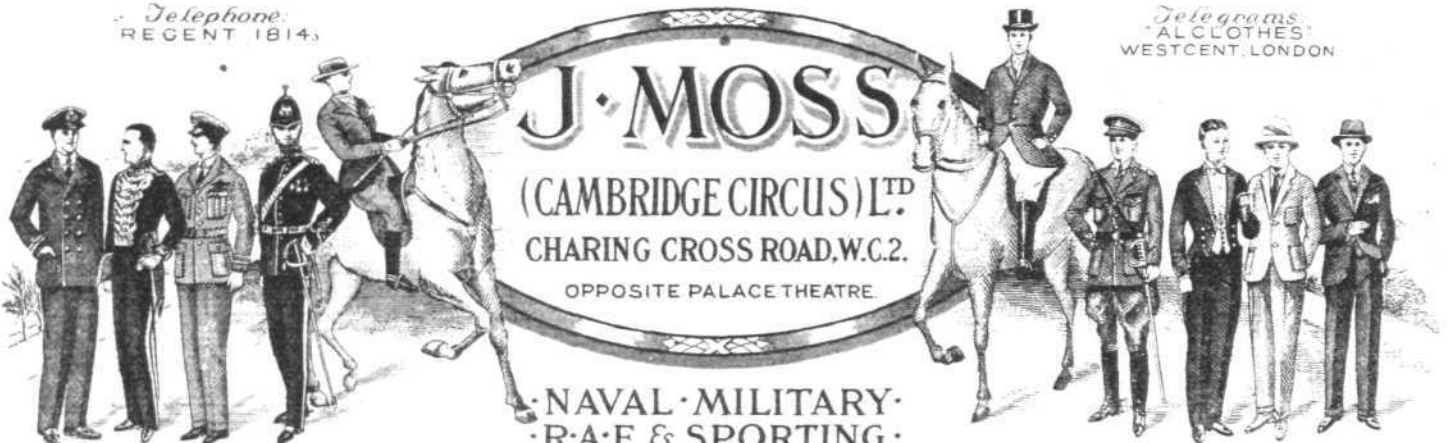
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" Cap and Badge	-	-	-	£1 8 0	" Shoes	-	-	-	£1 5 0	" Wellingtons	-	-	-	£2 10 0
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Actual photograph taken from accompanying plane, at instant after man had jumped and pulled the rip cord—his Irvin is seen instantly opening.

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Bristol

"A record run for an aero engine in Australia."

The following extracts are from an *unsolicited* letter, dated Jan. 4th, 1929, received from Mr. Hudson Fysh, Managing Director of the Queensland and Northern Territory Aerial Services, Ltd., of Longreach, Australia:—

"We feel you will be interested to have details of 'Bristol' Jupiter engine No. J.6324 which has just completed nine months continuous service as fitted to our D.H.50J aircraft G-AUHE constructed by us at our Longreach workshop.

Period:—March 20th, 1928—December 23rd, 1928.

Engine Hours:—In air ... 297 hrs. 10 m.
On ground 51 hrs. 45 m.
Total ... 348 hrs. 55 m.

Machine Miles:—25,472.

Replacements:—5 valve caps, 1 oil connecting nipple, 1 valve spring, 1 set plugs.

Value of replacements (excluding plugs):—14'6d.

Fuel used:—Shell Motor Spirit.

Oil used:—Shell Super-heavy Aviation.

During the period of running the engine was not touched for repair purposes except for fitting the above-mentioned replacements. At the end of the period the engine was removed for overhaul, running perfectly and giving full revolutions.

We feel that the above is in all probability a record run for an aero engine in Australia without top or general overhaul."

The Jupiter is designed
and manufactured by

THE BRISTOL AEROPLANE CO., LTD.,
FILTON — BRISTOL.

Telegrams:
"Aviation, Bristol."

Telephone:
3906 Bristol.